THE MARINE REVIEW

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Ready to Deliver Our Own Goods

Overseas Marine of 9,000,000 Tons Promised by End of 1918—In Peace Times, This Fleet Could Carry 60 Per Cent of American Commerce

THE war so thoroughly dominates the industrial life of the country at the present time that epochal changes in commercial practices, although occurring almost daily, pass unnoticed. The immediate purpose of these changes is clear, that is, the winning of the war. The ultimate effect is hidden in obscurity. The lack of any precedent to which to cling contributes to the indecision with which the future is faced. But the serious and sincere desire to bring victory to this country's arms robs this indecision of the terror which such a mental condition normally inspires.

An excellent illustration of the revolutionary character of these changes is furnished by the article, presented in one of the succeeding pages of this issue, in which the government reveals the details of its merchant shipbuilding plans.

The foreign trading merchant marine of the United States, one month before the first shot was fired in the European war, barely exceeded one and one-half million tons. At the end of 1918, government officials predict that our merchant fleet available for overseas trading will total more than nine million tons.

Beating the Record of a Century

In the preceding 100 years, our foreign trading merchant marine had measured its yearly growth by a few thousand tons, its monthly growth by hundreds. The actual record shows that American ships registered in foreign trade in the 100 years preceding the opening of the war, had increased from 800,000 tons to 1,000,000 tons. In the intervening years, of course, this overseas tonnage had for a time reached a much higher level. Ten years before the Civil war, it was close to 4,000,000 tons. The decline of our foreign trading marine after the Civil war had brought the total in 1910 to a level below that of 100 years earlier. In the next four years a sufficient improvement set in to give 1914 a total 200,000 tons greater than in the corresponding year of the previous century. Against an average monthly gain in that century of 200 tons, we are assured now of an average monthly gain in four and one-half years of armed neutrality and of war, of 140,000 tons.

The government's announcement does not take into account any prospective losses from submarines during the period the shipbuilding program is being carried out. The figure includes a large number of requisitioned ships which were contracted for by foreigners. The final ownership of these ships will have to be determined by negotiations through diplomatic channels. All of the ships may not be completed by the end of next year, as Washington officials predict. But liberal allowance for losses through submarines, through surrender to original foreign owners and through delays in completing contracts, still leaves a foreign trading merchant marine that will make this country more nearly independent of foreign shipowners than at any time during the last half century.

A Factor in World Trade

The National Foreign Trade council was authority for the statement made a year ago that from 6,000,000 to 10,000,000 tons of steamers of various sizes and types would be necessary to carry 60 per cent of the trade of the United States. This assertion was based on the premise that with a merchant marine of that size, this country would inevitably be drawn into general world trade which would require the services of a portion of our ships. The government's statement shows that the maximum estimate of the trade council is to be approximated within a year, with congressional sanction already given for another 5,000,000 tons to be built in 1918 and 1919.

This marvellously rapid expansion of our merchant marine is of inestimable importance to all American industries. Lloyd George's war cry of "ships, ships and more ships" was raised years ago by those who sought to arouse this country to the need of an adequate merchant marine. The present assurance of plenty of American ships arouses even greater satisfaction since it comes at a time when the country's industrial life is being refashioned almost daily.

13 Lake Vessels Ordered to Coast

Emergency Fleet Corporation is Sending All Available Lake Boats to Salt Water—Ships Being Cut in Two at a Number of Lake Yards

THE United States shipping board through its district office at Cleveland, is pushing its plans for sending to the Atlantic all available lake ships. Up to Oct. 12, orders had been issued to 13 ships, having a total gross tonnage of 32,768, to proceed to drydocks, preparatory to being cut in two and made ready for the trip through the Welland canal and down the St. Lawrence river. Some of these ships have already made the trip. Many additional vessels are to be sent to salt water. Up to date, only package freight and passenger ships have been taken, as every effort is being made to avoid hampering lake commerce. Several bulk freighters will be cut in two before ice sets in.

The 13 ships taken are the AMERICA, MINNESOTA, CODORUS, MAHONING, NORTHERN QUEEN, NORTHERN LIGHT, NORTHERN WAVE, NORTHERN KING, NORTH WIND, TUSCARORA, SENECA, BETHLEHEM, and SARANAC. The NORTH WEST will be sent through the canal by her owners. Six ships of the Canada Steamship Lines, Ltd, have been taken over by British authorities. These are the H. M. PELLATT, J. H. PLUMMER, BEAVERTON, A. E. AMES, MAPLETON, and SASKATOON.

The accompanying illustrations show a lake steamer being cut apart and made ready for her trip to the coast. This ship is the SOUKAHRAS, just completed at a lake yard. She was ordered by Gaston, Williams & Wigmore, and sold on the stocks to the Oriental Navigation Co. She is 387 feet in overall length, 43.9 feet wide and 28 feet deep. Her gross tonnage is 3819. She is not yet formally included among the ships taken over by the shipping board as her builder will not complete his contract until she is joined together at a Canadian port.

General detail of the 13 ships, giving the owner, date when built, dimensions and gross tonnage follow:

AMERICA; Crosby Transportation Co.; 1893; 293 x 42 x 23; 2357.

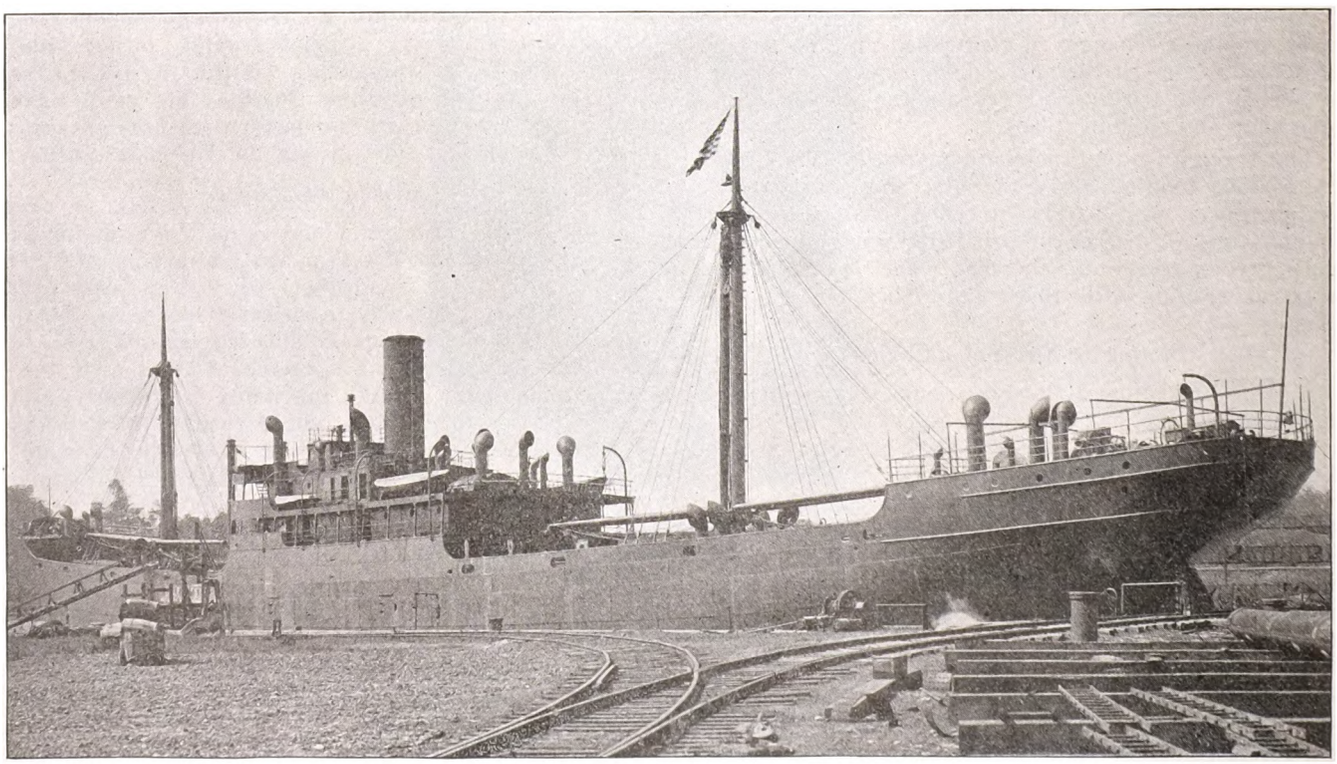
MINNESOTA; Chicago, Racine & Milwaukee Line; 1888; 288 x 41 x 23; 3320.

Owned by Great Lakes Transit Corp.: CODORUS; 1892; 275 x 40 x 26; 2165: MAHONING; 1892; 274 x 40 x 23; 2189: NORTHERN QUEEN; 1889; 300 x 41 x 21; 2476: NORTHERN LIGHT; 1888; 300 x 41 x 21; 2476: NORTHERN WAVE; 1889; 300 x 41 x 21; 2476: NORTHERN KING; 1888; 300 x 41 x 21: 2476: NORTH WIND; 1888; 300 x 41 x 21; 2476.

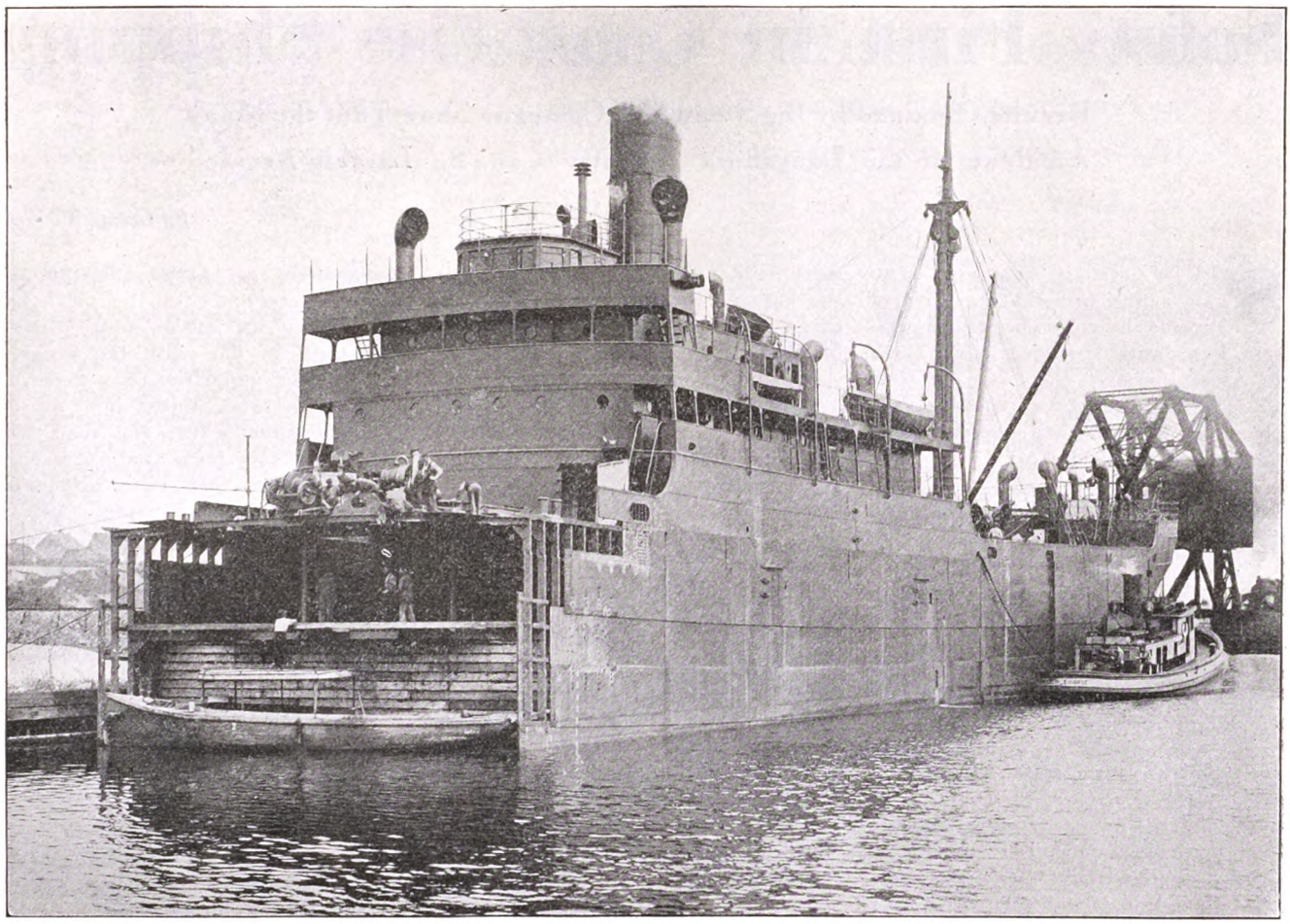
Owned by Lehigh Valley Transportation Co: TUSCARORA; 1890; 291 x 40 x 22; 2386: SENECA; 1889; 290 x 41 x 14; 2669: BETHLEHEM; 1888; 290 x 41 x 14; 2633: SARANAC; 1890; 290 x 41 x 14; 2669.

Answer Nation's Call

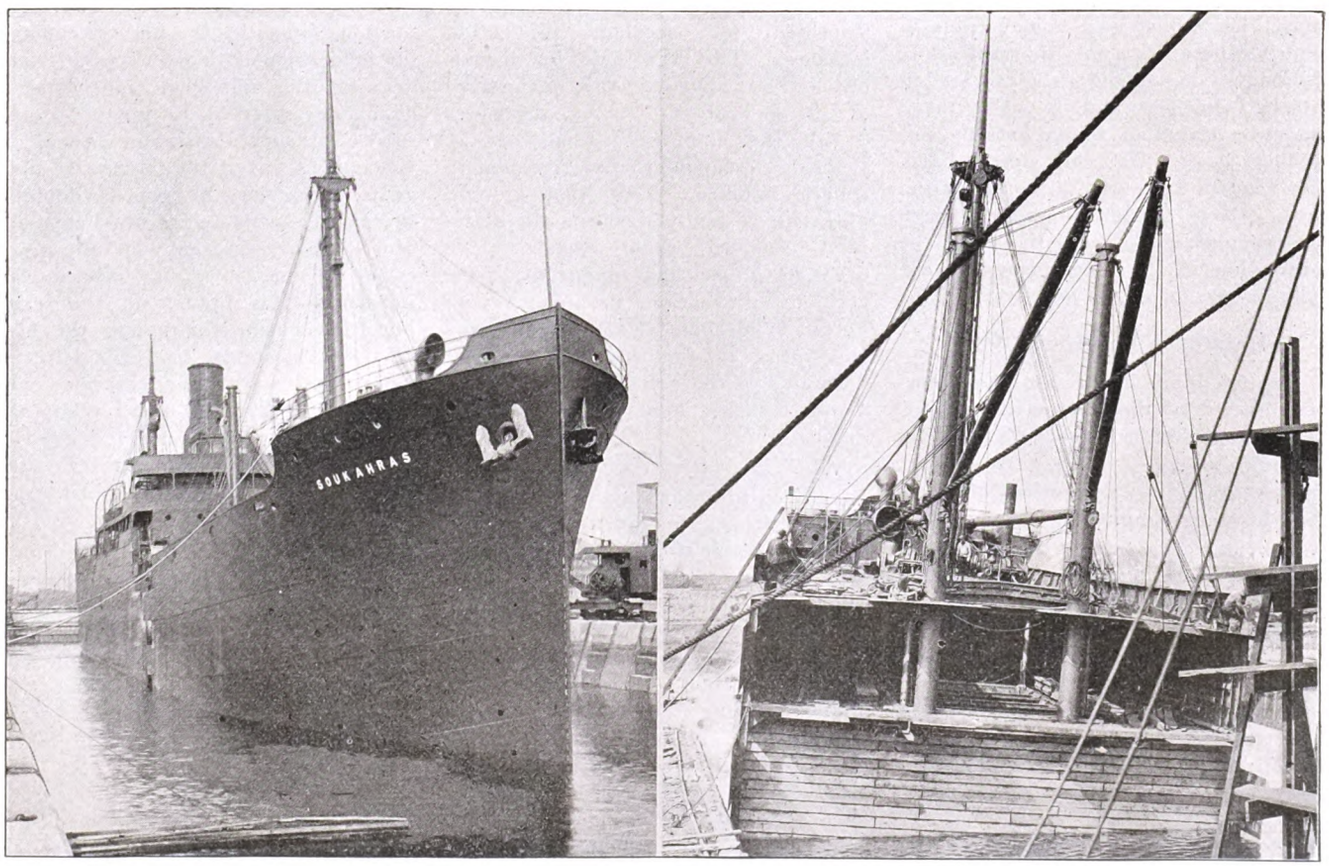
Steamship and shipbuilding companies are doing their share toward swelling the cash reserves of the nation as the country's second lot of Liberty bonds is being placed upon the market. Many of the companies are taking active measures with a view of enabling their employes to participate in the loan, such as arranging easy payments, etc. Among the companies which have made public the amount of their subscriptions up to this time are: The United States Steel Corp., New York City, $10,000,000; the Southern Pacific railroad, through Kuhn, Loeb & Co., New York City, $5,000,000; W. R. Grace & Co., New York City, $1,000,000; Shawmut Steamship Co., $100,000; Corrigan, McKinney & Co., Cleveland, $1,000,000; Pickands, Mather & Co., Cleveland, $1,000,000; Atlantic, Gulf & West Indies Steamship Co., through Hayden Stone & Co., New York City, $1,000,000; the Brynhilda Shipping Corp., through Equitable Trust Co., New York City, $175,000.



LAKE-BUILT STEAMER ENTERING DRYDOCK WHERE SHE WAS CUT IN TWO



AFTER END OF SOUKAHRAS JUST BEFORE LEAVING FOR THE ATLANTIC



LEFT—JUST AFTER CUTTING APART. RIGHT—FORWARD END AFTER BULKHEADING

Safety First in Coastwise Shipping

Results Obtained by Big Steamship Company Show That the Many Accidents in the Longshore Industry Can Be Largely Avoided

By George W. Wylie

SAFETY first in coastwise shipping, or preferably, accident hazards in coastwise transportation, is a desirable subject upon which to speak because there are so few statistics or experience records available for dispute. We readily recall the important results of:

(a) The international conference on safety of life at sea following the Titanic disaster;

(b) The seaman's act;

(c) The conference on the subject of making passenger vessels more secure from destruction by fire held by the department of commerce; also

(d) The valuable reports of the supervising inspector of the steamboat inspection service of that same department; as well as

(e) The report of the committee appointed to investigate the sinking of the steamer EASTLAND.

All of these reports, conferences and resulting legislation inured to the benefit of passengers and seamen on vessels. But this is not the entire field of the marine hazard. There is in all steamship operations, whether lake, gulf, transatlantic or coastwise, a most vital industry—a unique trade in which there is no apprenticeship. Abroad, it has found its place among other industries and is not looked upon or classified as an entirely unskilled labor. On the other hand, the United States is the only nation with a large foreign commerce which has absolutely no regulations for the protection of the men engaged in it. This is the *longshore industry.*

Hazards in Longshore Work

To my mind, herein lies the everyday hazard of the coastwise shipping. The danger of the seaman's life has become a truism, but the extreme hazard attending the longshore work has been overlooked.

In view of so many safety regulations and devices in effect to prevent the loss of life and limb caused by fire and collision, let us turn for the moment to the longshoreman and the hazards of his employment. In the ordinary industry we deal with fixed hazards and a more or less permanent class of labor but in stevedore and longshore work neither of these conditions exists, the hazards varying according to the cargo being handled and the means of transportation used.

It is not a difficult matter to affix a safeguard to a machine and enforce its use to the mutual benefit of both employer and employe, but to apply safety measures to the handling of various kinds of cargo each of which must be moved and stowed with regard to its contents, weight, bulk, size and fragility, and by an ever changing class of employes is a problem worthy of considerable study. The majority of the accidents and fatalities to longshoremen are not due to defective ship's gear and rigging or to inadequately guarded or improper pier equipment but rather as the result of the inherent risk of the employment.

It is a fact that longshoremen as a body are made up of the uneducated classes of many nationalities who work under chronic conditions of oversupply and shortage of labor; but this is only another reason for the enforcement of accident prevention measures. This can best be accomplished by teaching the advantages of the application of safety principles to all the employes of all of the steamship companies from president to freight handler. This kind of employment certainly warrants the statement founded upon experience in other businesses that one-third of the accident prevention problem is involved in mechanical safeguarding and two-thirds in the education of the workmen to the realization that safety work benefits him more than the employer.

With the safety movement so advanced in all other lines of industry, it is surprising to find the entire disregard for the already familiar slogan "Be Careful" in connection with longshore work on the piers, in the ships or on the lighters owned or controlled by steamship companies. That such a condition of affairs exists generally cannot be denied if you consider the excessive number of accidents and the unwillingness of insurance companies to accept longshoremen as a class for any form of insurance except at a prohibitive rate, as evidence of this assertion. The best explanation that I can offer for this general acceptance of the old story, without any attempt to add a chapter on safety in line with the progress in all other industries, has been the lack of personal supervision by the companies themselves and their willingness to rely upon that representative to whom they have paid large sums annually for protection and indemnity and little service in respect to the prevention of accidents. To successfully effect safety practice we must go a long way back of the individual employe and get at the heads of the business.

Need for Legislation

Aside from the general needs for the institution of adequate safety regulations, another and even graver exigency has presented itself by the upset of the state workmen's compensation statute caused by the recent decision of the United States Supreme Court in the cases of the Southern Pacific Co. vs. Jensen, and the Clyde Steamship Co. vs. Walker. The effect of these decisions by the highest court in the land makes it more necessary than ever for the individual transportation companies affected to prepare themselves for such legislation as may be enacted to cover the industrial accidents of carriers by sea. I doubt if there are many steamship company representatives present who fully appreciate the needs for a uniform law governing this branch of the transportation business although the need of a federal statute has been felt ever since the state compensation laws became effective for under these acts steamship companies were obliged to pay as many different rates for this insurance as states in which they operated irrespective of the fact that the hazard was always the same.

With a view toward the humanitarian side of the industrial accident problem and for the purpose of gathering useful statistics concerning their particular risks of employment the steamship companies which I represent, the Clyde, Mallory and Southern, organized and put in effect under competent supervision a self-insurance department. By means of a dispensary, the formation of central and pier safety committees, the use of

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Presented at the marine and navigation sectional meeting, safety congress, National Safety council. The author, George W. Wylie, is manager, casualty department, Clyde Steamship Co., New York.

bulletin boards, and the installation of practical devices for safety suggested by the workmen themselves, we have not only reduced the number of accidents while handling more than the usual amount of tonnage but have obtained the co-operation of every workman from stevedore down to shenango.

What Investigation Revealed

We have hunted for and found what we believe to be the most frequent causes of accidents, the most hazardous commodity, and the places where the greater percentage of our accidents occur. Materials falling from piers, jammed between loads, and caught or cut by hooks in either the employe's or his fellow-workmen's hands produced most of our injuries. Lumber is by a large majority the most hazardous commodity that we transport. We have found that 70 per cent of our accidents occur in the holds of vessels, 15 per cent on the decks, 10 per cent on the piers, and only 5 per cent on lighters and barges (although I might add that our lighterage operations have been the cause of all of our fatal accidents). The result of our own particular short but helpful experience leads us to the conclusion that we have struck a truly fertile field for accident prevention. Greater results than these that I have mentioned are possible to every member of this committee from such a co-operation of steamship representatives as we wish to begin here today.

Therefore, I think it fitting and proper to begin the work with a resolution:

That, whereas we appreciate the hazards peculiar to all steamship operations and realize the benefits to be obtained from the earnest co-operation of all of us engaged in marine and navigation work, let us resolve now to get together for all times on the subject of safety.

The Whiting Foundry Equipment Co., Harvey, Ill., manufacturer of foundry equipment as well as cranes of many different types, is distributing catalogs illustrating its equipment for brass foundries, its converters and cupolas. These catalogs show illustrations of many different products and contain considerable descriptive matter.

The International Life Suit Corp., New York, exhibited its safety suit life preserver at the recent annual convention of the National Safety council at New York. The exhibit aroused a great deal of interest, a reflection of the increased attention now being given to measures for conserving life at sea.

Discuss Safety Measures

First Meeting of Marine Section of National Safety Congress Held in New York — Lively Interest Displayed

THE first meeting of the marine and navigation section of the National Safety Council was held at the sixth annual safety congress in New York, Friday, Sept. 14. The congress was attended by over 3000 persons, a large number of whom were interested in maritime subjects. The marine and navigation sections met in the grand ball room on the ground floor of the Astor hotel and the attendance justified the choice of this beautiful apartment.

The meeting was presided over by George W. Wylie, manager, casualty department, Clyde Steamship Co., New York, chairman of the marine and navigation section. He was assisted by Dr. F. L. Hoffman, statistician, Prudential Insurance Co., Newark, N. J., vice chairman.

Three papers were presented as follows: "Accident Prevention in the Steamboat Inspection Service," by George Uhler, supervising inspector general, United States steamboat-inspection service, Washington; "Accident Hazards in the American Merchant Marine," by Dr. F. L. Hoffman, statistician Prudential Insurance Co., Newark, N. J.; and "Safety First in Coastwise Shipping," by George W. Wylie, Clyde Steamship Co., New York.

General Uhler was unable to be present and his paper was read by title. The papers of Dr. Hoffman and Mr. Wylie are presented in full elsewhere in this issue.

Practical Men Shut Out

The discussion was opened by Captain Proctor of the Clyde line, who talked on accident prevention from the sailor's point of view. He said that American steamship captains are unnecessarily harrassed by laws and that the organization of the government departments in charge of marine safety is such that practical men do not get proper consideration. The opinions of such men, he said, are seldom asked when laws are being drafted or regulations formulated. It is not surprising, therefore, he pointed out, that 90 per cent of the certified lifeboat men, as they are designated under the seamen's act, cannot swim. Capt. H. P. White, a retired naval officer, said that in his judgment the greatest effort should be put forth to make the ships themselves safe rather than to devise appliances to prevent casualties after an accident has happened. Our laws regarding lifeboats, etc., he explained, while undoubtedly necessary, simply show we are locking the stable door after the horse has been stolen.

E. Platt Stratton, formerly steamboat inspection supervisor for the port of New York, pointed out that we must distinguish at the present time between sailors and boatmen. A man may be a skillful sailor and still not have the requisite training to handle a small boat in a rough sea. Boatmen however, are vital in a disaster.

Co-operation Starts at the Top

An exceedingly interesting discussion from the shipowner's point of view was presented by C. E. Mallory, vice president, Clyde Steamship Co., New York. Mr. Mallory emphasized the necessity for co-operation. He expressed the belief that safety work cannot be expected to produce results in any organization unless all of the higher officials are thoroughly in sympathy with it and actively interested in its progress. Co-operation, in other words, must start from the top. Mr. Mallory described the safety organization of the Clyde line which includes a central committee, pier committee and other subordinate committees. In closing, Mr. Mallory made an eloquent plea for schoolships for the training of Americans to man the American merchant marine. As long as we depend upon foreigners to fill out the crew lists of our ships, Mr. Mallory said, it cannot be claimed that we have an American merchant marine. Our merchant fleet must be Americanized, he continued, and the life of the sailor made attractive to our native born young men.

A. A. Renshaw, marine department, Standard Oil Co., New York, discussed accidents on barges and lighters. The trouble with most barge or lighter men, he said, is that they usually have had practically no actual seafaring experience. As a result they are not familiar with the handling of lines, the strength of hoisting tackle, etc. He also blamed the extensive labor turnover of the present time for a large proportion of the accidents that are now occurring on barges and lighters.

The two-masted schooner YUKON, building at Gloucester, Mass., for the fishing industry has been sold.

Accident Hazards in Maritime Work

An Analysis of the Accident Record of the American Merchant Marine Showing Effect of Seasons, Size of Ships and Power Employed—Remedies Suggested

By Dr. F. L. Hoffman

THE approximate loss of life in the American merchant marine may be conservatively placed at from 500 to 600 per annum. This estimate is based upon the assumption of a fatality rate of 3 per 1000, which, in all probability is rather below than above the facts of actual experience. In the British merchant marine the corresponding fatality rate is 5 per 1000.

At the outset of the discussion, a clear distinction should be made between navigation hazards proper, or such as are directly attributable to weather and other agencies, and accidents more or less inherent or incidental to maritime employment, such as directly concern the men employed in navigation and allied occupations, as separate and distinct from accidents to passengers or other persons on board.

Causes of Disasters

Primarily, the causes of maritime disasters are foundering, stranding and collisions, which in the American experience for recent years account for 62 per cent of the disasters attributable to all causes. Of the total 7.5 per cent were attributable to foundering, 24.4 per cent to stranding and 29.9 per cent to collisions. In the case of vessels on the Great Lakes, however, founderings account for only 4.3 per cent of the disasters, while strandings account for 27.8 per cent and collisions for 34.3 per cent.

There is, therefore, a very close and important relation between maritime disasters and, *first,* thoroughness and trustworthiness in weather warnings; *second,* the correct charting of harbors, coasts, etc.; *third,* a thoroughly well equipped and well maintained lighthouse and lightship service, including, of course, other aids to safety in navigation; *fourth,* a thoroughly well equipped and maintained lifesaving service; *fifth,* the highest attainable degree of efficiency in steamboat inspection, the survey of vessels, the inspection of hulls in connection with marine insurance, etc.; and, *sixth,* the most qualified governmental supervision of the efficiency of the labor employed for navigation purposes. There are no complete statistics for the United States regarding the loss of life in navigation, and practically no statistics whatever regarding the injuries sustained in connection with the labor on ships, or in their loading and unloading, or in the handling of freight, or in other duties of longshoremen. Since the inherent risk of all maritime occupations is the danger of drowning, it is but natural that the industrial experience of the Prudential Insurance Co. shows that in contrast to a proportion of 1.3 per cent of deaths by drowning in the mortality from all causes for all occupied males, the proportion was 11 per cent for persons employed in navigation.

The proportionate mortality is subject, however, to a very considerable range, as is best illustrated by the fact that the proportion of deaths by drowning in the mortality of barge captains was 39.1 per cent; of mates, 37.5 per cent; of deckhands, 20 per cent; of captains, 16.5 per cent; of marine firemen, 12.5 per cent; of sailors, 11.7 per cent; of marine engineers, 9.4 per cent; and of longshoremen, 5.3 per cent.

According to the Medico-actuarial experience, the general mortality of men employed in navigation is considerably above the average of employments without exposure to navigation hazards. In the experience of the British merchant marine, the accident fatality rate was 5 per 1000 for all maritime occupations during the period 1909-1913, or, specifically, 4.8 per 1000 for masters, 4.6 for sailors and 4.2 for engineers. As regards the fatality hazard at sea, there would, therefore, appear to be no very material difference in the accident liability of the most important specific occupations.

Steam vs. Sailing Vessels

Since the most important difference in navigation relates to the motive power employed, it is extremely significant that, according to British experience, the accident liability in the navigation of sailing vessels should be very decidedly in excess of the corresponding accident liability of steam vessels. During the period 1909-1913, the general mortality rate (including diseases) was 12.7 per 1000 for men on sailing vessels, against only 3.8 per 1000 for men on steam vessels. The accident mortality due to wrecks and casualties was 8.1 per 1000 for men on sailing vessels, against only 1.5 per 1000 for men on steam vessels. The mortality due to other accidents was 2.6 per 1000 for sailing vessels and 0.6 per 1000 for steam vessels. The mortality from diseases, excluding suicides and homicides, was 2 per 1000 for sailing vessels and 1.7 per 1000 for steam vessels. It is, therefore, self-evident that the replacement of sailing vessels by steam vessels has materially reduced the hazards to life in navigation and, in all probability, an improvment has also resulted in the general health of the men, largely because of better sanitary conditions, more commodious sleeping quarters and better ventilation.

Effect of Large Ships

A further reduction in the accident rate has resulted from the ever-increasing average size of the vessels employed. According to the American experience for recent years for vessels under 100 tons, in distress, 47.8 per cent were lost, against a loss of only 2 per cent in the case of vessels of 6000 tons and over. Since the small vessels, or those under 100 tons, constitute 25 per cent of the total American merchant marine, the losses are obviously of considerable economic importance. Other statistical evidence sustains the conclusion that the relative loss of life is decidedly less in the case of the larger vessels than in the case of the smaller vessels and that, therefore, an increase in the average size of vessels is equivalent to a reduction in navigation hazards to both passengers and crew.

There are no trustworthy statistics as regards the relation of the age of the vessel to the risk of total loss, but, of course, this factor invariably involves a higher ratio of lives lost in proportion to those on board. Of the vessels in the American merchant marine, 53.2 per cent are under 15 years of age, 21.3 per cent are from 15 to 25 years old, and 25.5 per cent were built more than a quarter century ago.

It is also of interest in this connection to state that there is a well-

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defined correlation between the season of the year and the occurrence of maritime disasters involving the loss of life and property. For the whole territory of the United States and adjacent waters, 18 per cent of the marine disasters occurred during the spring, 23.1 per cent during the summer, 31.6 per cent during the autumn and 27.3 per cent during the winter. On the Great Lakes, however, where navigation is practically suspended during the winter months, 46.2 per cent of the disasters occurred during the autumn and only 6.9 per cent during the winter. These statistics are of value, as indicating the seasonal variations in the necessity for adequate weather warnings and for the efficient provision for lifesaving services.

Of the vessels meeting with disasters of more or less serious importance in the United States during recent years, 64.5 per cent were steam vessels, 26.7 per cent were schooners and 3.9 per cent were barges; but for the Atlantic and gulf coasts combined 49.9 per cent of the vessels in disasters were steamers, 37.5 per cent were schooners, and 6.7 per cent were barges. There are reasons for believing that the occupational hazard in connection with barges on the Atlantic coast is decidedly more serious than is the case in coastwise navigation generally.

The average loss of life in navigation is, of course, measureable by different methods, but perhaps the most satisfactory for general purposes is the proportion of persons lost to those on board. According to the reports of the United States lifesaving service, or what is now the coast guard, of the vessels in distress on the Atlantic and the gulf 6.1 per 1000 of those on board were lost, against 5.4 on the Pacific, 8.3 on the Great Lakes, 7 on rivers and 13.4 at sea and in foreign waters. For all navigation territories combined, the fatality rate was 7.7 per 1000.

Need for Reliable Data

These tentative statistics are merely presented as a suggestion for the more thorough analysis of the available data regarding loss of life at sea, chiefly with reference to the men employed in navigation and related occupations. The whole question of dock labor, for instance, is one of the first importance, in view of the practical certainty that the fatality and general injury rate among this class of men is much higher than is generally assumed. Conversely, there are the strongest reasons for believing that methods of accident prevention in navigation and dock labor will prove productive of far-reaching and most gratifying results.

It is regrettable that no well defined governmental effort should ever have been made in the United States to collect trustworthy statistics of the loss of life in the American merchant marine and the injuries sustained by the men employed, according to the nature and degree of seriousness. The statistics which are annually collected by the bureau of steamboat inspection and the coast guard are inadequate to the present-day needs for an efficient safety-first movement in all of the industries concerned with water transportation.

Since under the navigation laws, every master is required to report deaths on board during the voyage and possibly while the vessel is in port and subject to admiralty jurisdiction, provided, however, that the vessel is engaged in foreign commerce or in coastwise commerce between ports on the Atlantic and the Pacific, it is strongly urged upon the National Safety Council that a unanimous resolution be adopted to the effect that the foregoing provision of the law should be enforced, and that an amendment to the navigation act should be passed by congress which would provide for the reporting of deaths and injuries on all vessels subject to the navigation laws, and that the bureau of navigation be given a sufficient clerical staff and facilities for the statistical tabulation and analysis of the information secured. Such action would conform to the long-time precedent of the British merchants' shipping acts, under which admirable returns have been secured for many years.

In addition, it may be strongly recommended to all companies engaged in water transportation that they follow the admirable precedent of the companies engaged in rail transportation, as regards the establishment of an efficient safety organization, absolutely indispensable to the attainment of the highest degree of security and comfort on the part of the employes. In view of the fact that most of the accidents are subject to the operations of the workmen's compensation laws, the prevention of such accidents is obviously a matter of considerable practical importance, aside from the humanitarian consideration, which demands that, as far as practicable, all unnecessary accidents should be done away with.

On the basis of the British workmen's compensation experience with reference to navigation, the probable fatality loss in the American merchant marine for the year 1917 is represented by an approximate value of $750,000, while the non-fatal injuries on the British basis represent an additional loss of $750,000. In all probability, by American standards of compensation, these losses would be materially increased.

During a period of war no class of labor is of a higher economic and social value to the nation than that which is employed in navigation and which is, therefore, entitled to the highest consideration of security and comfort obtainable under a well coordinated policy on the part of the government, the transportation companies, labor organizations and the public at large.

September Ore Shipments

For the first month since May the lake fleet in September moved less iron ore than was carried in the corresponding month of 1916. The actual shipments of iron ore from upper lake ports were 9,536,152 tons, against 9,600,785 tons in September, 1916. The September total was about 610,000 tons less than the tonnage shipped in August and 705,000 tons below the high-water mark set in July.

The total shipments up to Oct. 1 total 46,059,706 tons against 48,816,650 tons shipped in the corresponding period last year. The decrease of 2,756,944 tons compares with a corresponding decline of 2,692,310 tons on Sept. 1; 2,988,956 tons on Aug. 1; 3,480,432 tons on July 1, and 3,612,847 tons in June.

The detailed shipments by ports during September and up to Oct. 1, 1917, follow:

Port	September, 1917	To Oct. 1, 1917
Escanaba	1,078,531	5,167,722
Marquette	509,754	2,408,816
Ashland	1,199,297	5,625,209
Superior	2,174,530	10,376,746
Duluth	3,190,347	15,189,368
Two Harbors	1,383,693	7,291,845
Totals	9,536,152	46,059,706
1917 decrease	64,634	2,756,944

Lake Erie Receipts

Out of the total of 9,536,152 tons of iron ore shipped from upper lake ports in September, Lake Erie ports received 7,313,084 tons, as shown by the records of THE MARINE REVIEW. The balance on dock on Oct. 1 was 7,727,036 tons against 7,230,024 tons on Oct. 1, 1916. The detailed receipts by ports follow:

Port	Gross tons
Buffalo and Port Colborne	1,237,677
Erie	274,128
Conneaut	1,213,829
Ashtabula	1,707,872
Fairport	325,965
Cleveland	1,336,854
Lorain	540,192
Huron	260,131
Toledo	386,255
Detroit	30,181
Total	7,313,084

What the Government is Doing

Rulings on Marine Matters — Improvements to Waterways

Hints to Navigators

1039 Ships Now Building for U. S.

A MERCHANT fleet of 1600 vessels aggregating 9,200,000 tons, designed to carry the foreign commerce of the United States, is the mark which the shipping board expects to reach by the end of 1918. This total includes American ships now in service, German and Austrian boats taken over when the war opened, and the vessels for which the Emergency Fleet corporation has contracted. No reckoning is made for losses which submarine activities may cause before the program is completed.

Two statements issued a few days ago at Washington give an insight into the immensity of the government's shipbuilding plans. Admiral Capps stated that the government has under construction 1039 cargo vessels having a deadweight tonnage of 5,924,700. This list includes about 400 vessels, many of them of foreign ownership, which were requisitioned on the stocks. Most of the 1039 vessels will be completed by the end of 1918, initial deliveries being expected late in November, this year.

11,000,000 Tons is Goal

The additional funds asked of congress will provide for the construction or purchase of approximately 5,000,000 tons deadweight to be completed in 1918 and 1919, raising the total of new construction under contract and the prospective tonnage to 10,924,700 tons deadweight.

The committee on public information at the same time gave out a statement which, while differing slightly from the announcement of Admiral Capps, reveals further details of the government's plans. The 458 ships of over 1500 tons deadweight which the United States now has available for foreign trade, aggregate 2,871,359 tons. The German and Austrian tonnage seized totals 700,285 tons while the requisitioned ships under construction total 2.500,000 tons. The shipping board's own program calls for a total tonnage of 3,124,700, giving a merchant fleet of 9,200,000 at the end of 1918 compared with 1,614,222 tons on June 30, 1914, a month before the European war began. It is interesting to recall that the National Foreign Trade council in a report to congress in June, 1916, expressed the conviction that this country should have a foreign trading fleet of 6,000,000 to 10,000,000 tons in order to develop properly American export trade and to carry 60 per cent of our own commerce.

Rear Admiral Capps, chairman of the Emergency Fleet Corp., recently issued the following statement:

During the past two months the Emergency Fleet Corp. has awarded contracts for 118 wooden vessels of 3500 tons deadweight capacity each to 27 different shipyards.

There had previously been awarded contracts for 235 wooden vessels of similar type to the above and for 58 vessels of composite construction, thereby making a total award to date of 411 wooden and composite vessels of an aggregate deadweight tonnage of 1,460,900.

During the past two months the designs for machinery have been completed for the manufacture of engines, boilers and other articles of equipment for these vessels, for which the facilities available of machine shops and boiler works throughout the country have been availed of. Specifications have been prepared and negotiations outlined and initiated for the assembly and installation of machinery in wooden vessels, the most of which have been or are being constructed as "hulls only".

Great difficulty has been experienced on the Atlantic coast in obtaining suitable lumber for these ships, and it is anticipated that there will be greater delay in their completion than was expected when this movement was begun, notwithstanding every possible effort on the part of the corporation and its contractors.

Since Aug. 1 there have been awarded contracts for 155 steel cargo vessels of 1,076,800 tons deadweight tonnage, distributed among six shipyards. The most important of these contracts are for vessels of the so-called fabricated type, and special shipyards are being prepared for them.

Contracts for the boilers and machinery and steel construction of these vessels have already been placed and the contractors are actively at work in the preparation of the sites for the assembling of these ships. The best efforts of the Emergency Fleet Corp. are devoted to expediting these great shipbuilding projects.

Previous to Aug. 1, 70 steel cargo vessels of 587,000 tons total deadweight capacity had been contracted for. These vessels were distributed among 10 shipyards. Therefore at the present time the total number of steel vessels under construction for the United States is 225, with a total aggregate deadweight tonnage of 1,663,800.

Requisitioned Vessels

By proclamation of Aug. 3, 1917, the Fleet corporation, under authority delegated by the President, under the provisions of the emergency act approved June 15, 1917, requisitioned all vessels under construction in the shipyards of the United States of 2500 tons deadweight capacity and above. By this act the United States acquired a total number of 403 vessels, determined by the progress reports obtained from the various shipyards to be actually under construction; in many cases, where keels had not actually been laid, engines, boilers, equipment and materials, all of which were also requisitioned, are in various stages of progress, and in comparatively few cases contracts existing for vessels not actually begun, which may or may not be proceeded with, as the merits of each case, compared with what is desirable construction, are considered.

The total deadweight tonnage under construction thus acquired, and on which orders have been issued to proceed with the maximum expedition, exceeds 2,000,000 tons.

There are now under construction for the Emergency Fleet Corp.:

Type of vessel	Number of vessels	Total deadweight tonnage
Wood	353	1,253,900
Composite	58	207,000
Steel	225	1,663,800
Requisitioned	403	2,800,000
Grand total	1,039	5,924,700

In addition to the above, congress

in a recent act has authorized the construction of additional vessels whose total deadweight capacity will be nearly 5,000,000 tons. Plans for the major portion of these additional vessels are now in course of preparation and many of them will be of special types adapted to particular necessities of war, and while substantially cargo carriers will have much greater speed than the cargo vessels now under construction.

The corporation has ascertained from the builders of requistioned vessels their demands for structural steel, machinery and various items of equipment and is endeavoring to regulate the supply of these items to provide for the individual needs of the shipbuilders in accordance with their program of capacity, so far as the country's resources are available. And it is apparent that with the similar needs of the naval service and the war department, with which the Emergency Fleet Corp. is working in harmonious co-operation, every mechanical resource of the United States, with considerably increasing development, will be necessary for the realization of this program and what must follow in continuation of it.

Industrial Service Department

The Fleet corporation has instituted an industrial service department which, by co-operation with the department of labor, is undertaking to assist shipbuilders and others in the employment of suitable labor and to initiate an extensive system of vocational training with the purpose of adapting allied trades and unskilled labor for service in shipyards, and through co-operation with the Young Men's Christian association organization throughout the United States to give attention to the housing and personal affairs of the men recruited for shipbuilding work. The vast development of shipbuilding essential to this emergency necessitates an agency of this kind because up to this time the thinning out of unskilled men in the older shipyards over a large territory is, in many instances, resulting in greatly decreased production. It has been estimated that 150,000 new men are necessary for full production.

With the passage of the pending bill, congress has authorized $1,799,000,000 for the shipping board and the Emergency Fleet Corp. and the actual appropriations made, including those in the recent bill, reach a total sum of $1,085,000,000.

Amend Inspection Rules

The steamboat inspection service has issued a circular letter, addressed to inspectors of the service, boiler manufacturers, manufacturers of boiler plate, and steamboat companies, containing amendments of the general rules and regulations of the board of supervising inspectors and approval of vessel equipment and boilers as adopted by the executive committee of the board at a meeting held from Aug. 15 to 22, inclusive, 1917.

The following paragraph relating to determining the area of segment of boiler head was struck out:

The area of the segment of a head to be stayed shall be that surface contained within a line drawn 3 inches from the inner circle of the head and 2 inches from the tubes or flues.

The following rule for determining the discharge capacity of a flat-seat safety valve was adopted:

The discharge capacity of a flat-seat valve shall be 1.4 times that allowed for a bevel-seat valve.

The restrictions relating to tensile strength required for steel boiler plates as contained in amended rules were struck out of the rules and regulations by the following amendment:

Section 5 of rule 1, general rules and regulations, all classes, reading as follows, was struck out:

"The tensile strength determined by the tests shall be not less than 58,000 pounds per square inch of section nor more than 73,000 pounds per square inch of section and the elongation measured in a gage length of 8 inches shall be not less than 20 per cent."

and the following paragraph was substituted therefor:

"All steel plates tested shall show an elongation of at least 20 per cent measured in a gage length of 8 inches."

Owing to the excessive demands for officers of merchant vessels created by the exigencies of the war, experience and examination requirements for license as master, mate, pilot and engineer of merchant vessels, as contained in sections 20, 21, 22, 23, 26, 31 and 32 of rule V, general rules and regulations, both in Great Lakes and river rules, were struck out, and the issuance of licenses to officers of vessels within the classifications referred to was left by rule to the judgment and discretion of the local inspectors, as vested in them by law, the sufficiency of the experience of an applicant for license to be determined by the local inspectors when applicant applies for examination for license.

House Flags and Funnel Marks

The United States bureau of navigation announces the registration, pursuant to section 7 of the act of May 28, 1908, of the following house flag and funnel marks of the Vacuum Oil Co., New York: House flag—rectangular white flag having thereon the word "Gargoyle" in black letters with a red stripe extending from end to end of the word through the center of each letter, and underneath a grotesque figure in red and black; funnel marks—black funnel with the letter V in white imposed thereon.

U. S. Will Have 1,600 Ships of 9,200,000 Tons

This statement was prepared with the assistance of the experts of the United States shipping board and approved by the full board, and was issued by the committee on public information on Sept. 26. The figures may be regarded as definitely accurate:

The United States has today 458 ships of over 1500 deadweight tons with an aggregate tonnage of 2,871,359, either engaged in or capable of participating in foreign trade. There are also 117 ships of a tonnage of 700,285 of German and Austrian origin. The United States Shipping Board Emergency Fleet Corp. has commandeered nearly 400 steel ships of more than 2,500,000 tons which are being completed or under contract for construction in American yards. The board's fleet corporation has also contracted for 636 ships with a tonnage of 3,124,700. Totaled, these figures show that the United States will have near the end of 1918 a merchant fleet of more than 1600 ships aggregating 9,200,000 tons to carry its foreign commerce, as compared with an overseas marine of 1,614,222 tons on June 30, 1914, scarcely a month before the European war began.

The tonnage referred to is exclusive of that engaged on inland waters, unsuitable coastwise ships and small craft operating along the coast and in bays and harbors, and does not, of course, include the prospective additional program of the Emergency Fleet corporation.

The fleet in prospect is already becoming a reality. Several of the commandeered ships are already taking cargo; others will leave the ways in increasing numbers with each succeeding month. The ships for which the shipping board has contracted are under construction and the first launching is expected within 60 to 90 days.

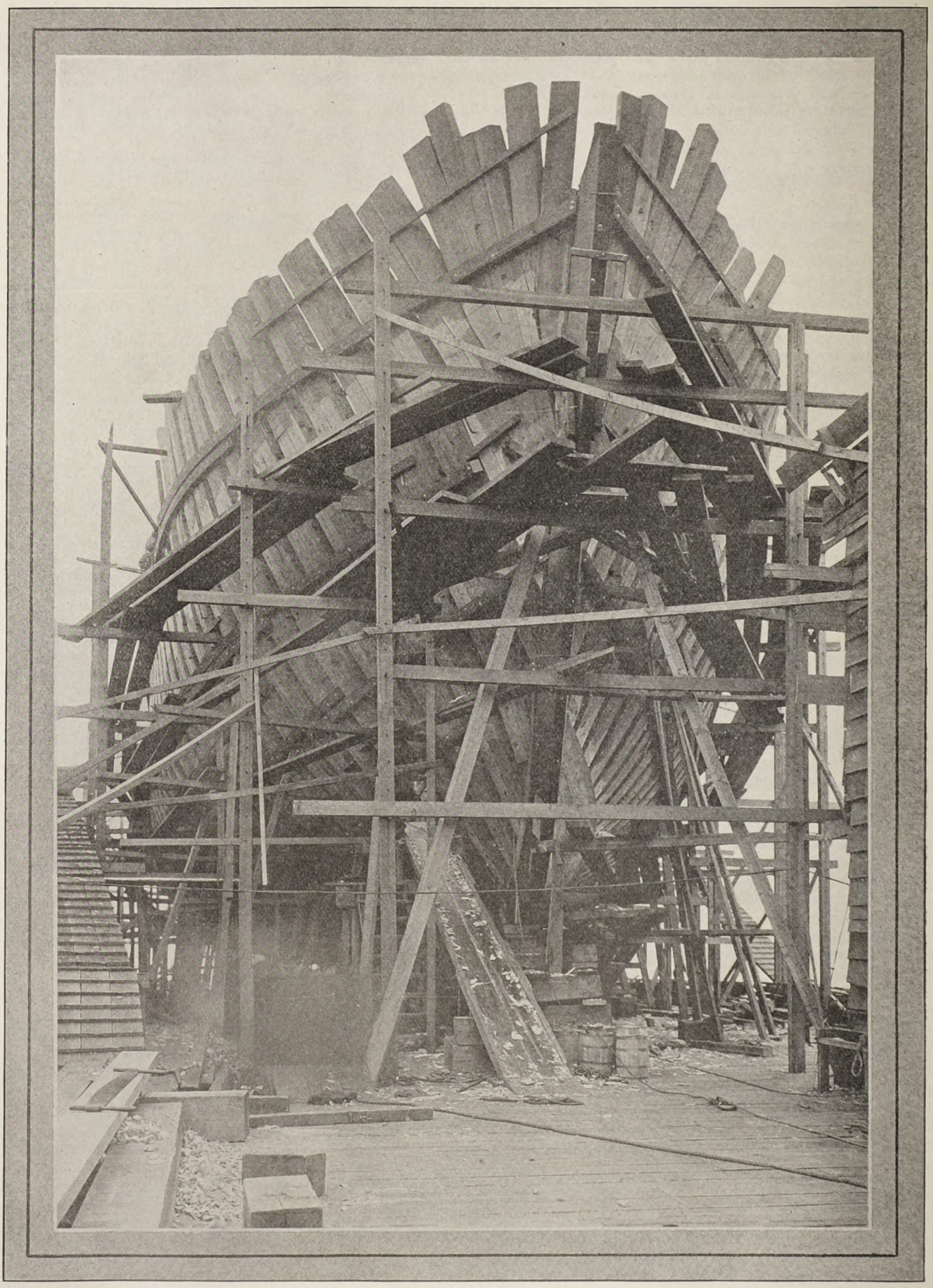


FIG. 83—BOW CONSTRUCTION OF A LARGE PACIFIC-COAST MOTOR SCHOONER

How Wooden Ships Are Built—VI

This Chapter Explains Methods of Framing the Forward End of the Ship—Methods of Trimming Timbers Also Are Described

By H. Cole Estep

IN FRAMING the ends of a ship special problems are encountered. The stem, at the forward end and the sternpost at the rear, must be set in place and the surrounding timbers properly arranged before the planking operations can be commenced. Of the two ends of the vessel, the framing of the bow is much the simpler.

Today wooden ships usually are built with either clipper bows or steamer bows. Vessels with auxiliary power usually are provided with clipper bows while full-powered motor vessels or steamships have steamer bows with the customary straight stem. The chief characteristics of these two types bows are generally understood. The steamer bow is perhaps the less artistic of the two, although easier to frame. In the steamer bow the stem is set perpendicular to the keel; in the clipper type bow, the stem has a rake forward and is set at an acute angle to the keel. A typical clipper bow, with the framing in place ready for planking, is shown in Fig. 83. A steamer bow, in a similar stage of completion is shown in Fig. 94.

The bow construction of modern wooden ships has been greatly simplified by the large timbers now available in all sections of the United States, particularly on the Pacific coast. In the old days in England it was necessary to build up the stem, deadwood, apron, knighthead, etc., out of a great many pieces, all of which had to be carefully locked, scarfed, hooked and bolted together. In some old English ships of the line, as many as 34 pieces were used in the stem construction. The stem proper of modern wooden ships can be easily fashioned from one piece. The apron likewise can be made of one piece, and the knightheads may be similarly gotten out. As shown in Figs. 84 and 96, the frames near the stem must be swung or canted forward, out of square with the line of the keel. This is done in order to avoid excessive molding dimensions. Frames which are so swung are termed cant frames, whether they are located in the forward or after part of the vessel. The remaining frames, usually, are known as square frames. On the Pacific coast at the present time, however, the term cant frame is more loosely construed to mean any frame which heels against the deadwood as in Fig. 96, instead of against the keel.

On account of the tapering of the ship toward the forward end, it is necessary to fill up the thin portion with blocks of timber termed deadwood in order to form a suitable footing for the frames. In the case of clipper type ships, such as that shown in Fig. 83, it is not possible, even, to heel all of the frames against the deadwood, and some of the shorter ones near the upper part of the stem are heeled against the apron, which is a piece fitted immediately behind the stem. This construction is clearly shown in Figs. 83 and 89. The short timbers in the latter illustration, parallel to the stem, are known as knightheads. They are utilized to fill out the framing where the bows are comparatively blunt. Some years ago old-line English wooden shipbuilders thought it absolutely necessary to use oak for the stems of wooden ships. Modern experience, has indicated, however, that this is not necessary at all, and at the present time fir, yellow pine and other woods are employed with equal success. In fact, the latter woods are preferable on account of the large sizes in which the timbers may be obtained. The advantage of using larger timbers already has been discussed.

If, however, it is necessary to build up the stem of more than one piece, the sections should be connected by scarfs similar to those used to connect the pieces of keel together. These scarfs should be so disposed as to give a good shift to the pieces of the apron, in case the latter also is composed of more than one piece. On account of the strain to which they are subjected, it is not a bad idea to dowel scarfs of this character.

Prior to 1850 it was customary to join the stem to the fore piece of keel by means of a curved scarf. It was necessary, therefore, to convert the stem from a timber which already had the necessary natural curvature so as to avoid shortness of grain at the thin lip of the scarf. In such cases, also, to aid in the conversion of the timbers, a portion of the curvature of the fore-foot was included in the fore-piece of keel by placing the scarf a little higher up the stem. At the present time, however, a vertical scarf similar to that shown in Figs. 84 and 97 usually is employed and the joint is reinforced by inserting a natural knee. Sometimes this knee goes in over the deadwood as in Fig. 84. In other cases, it constitutes the lowest piece of deadwood as in Fig. 97. In the lat-

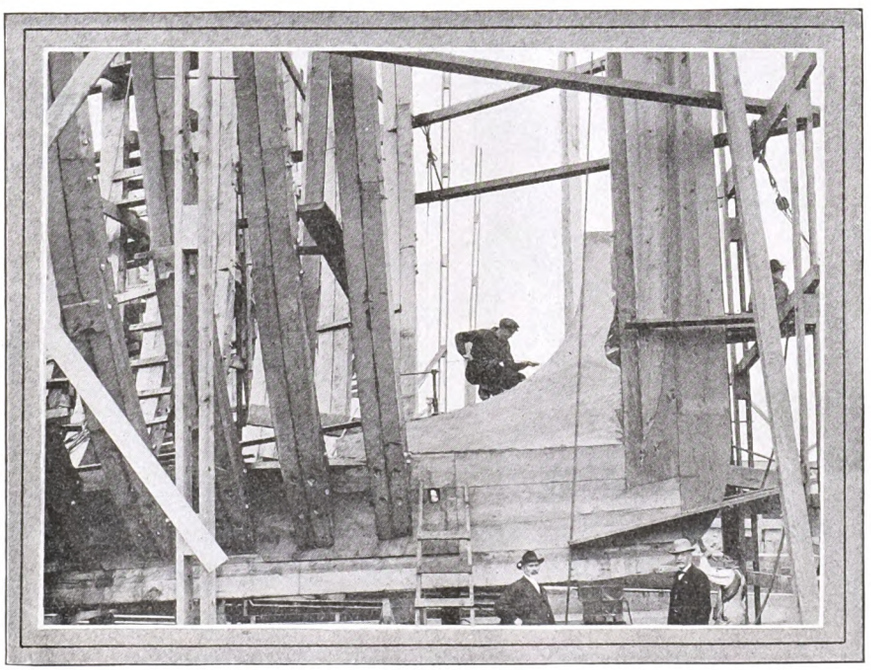


FIG. 84—DETAILS OF STEM SHOWING LARGE NATURAL KNEE

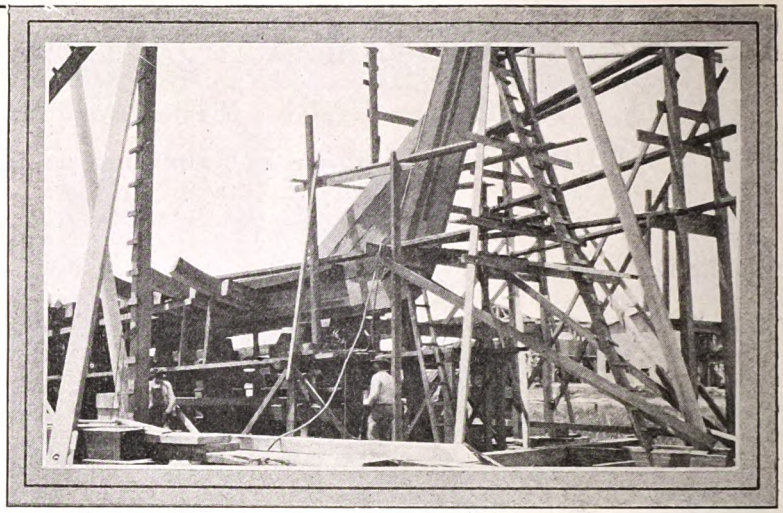


FIG. 85—STEM REINFORCED WITHOUT USE OF A KNEE.

FIG. 86—DETAILED DRAWING OF STEM OF A STEAMER THE GENERAL ARRANGEMENT OF WHICH IS SHOWN IN FIG. 84

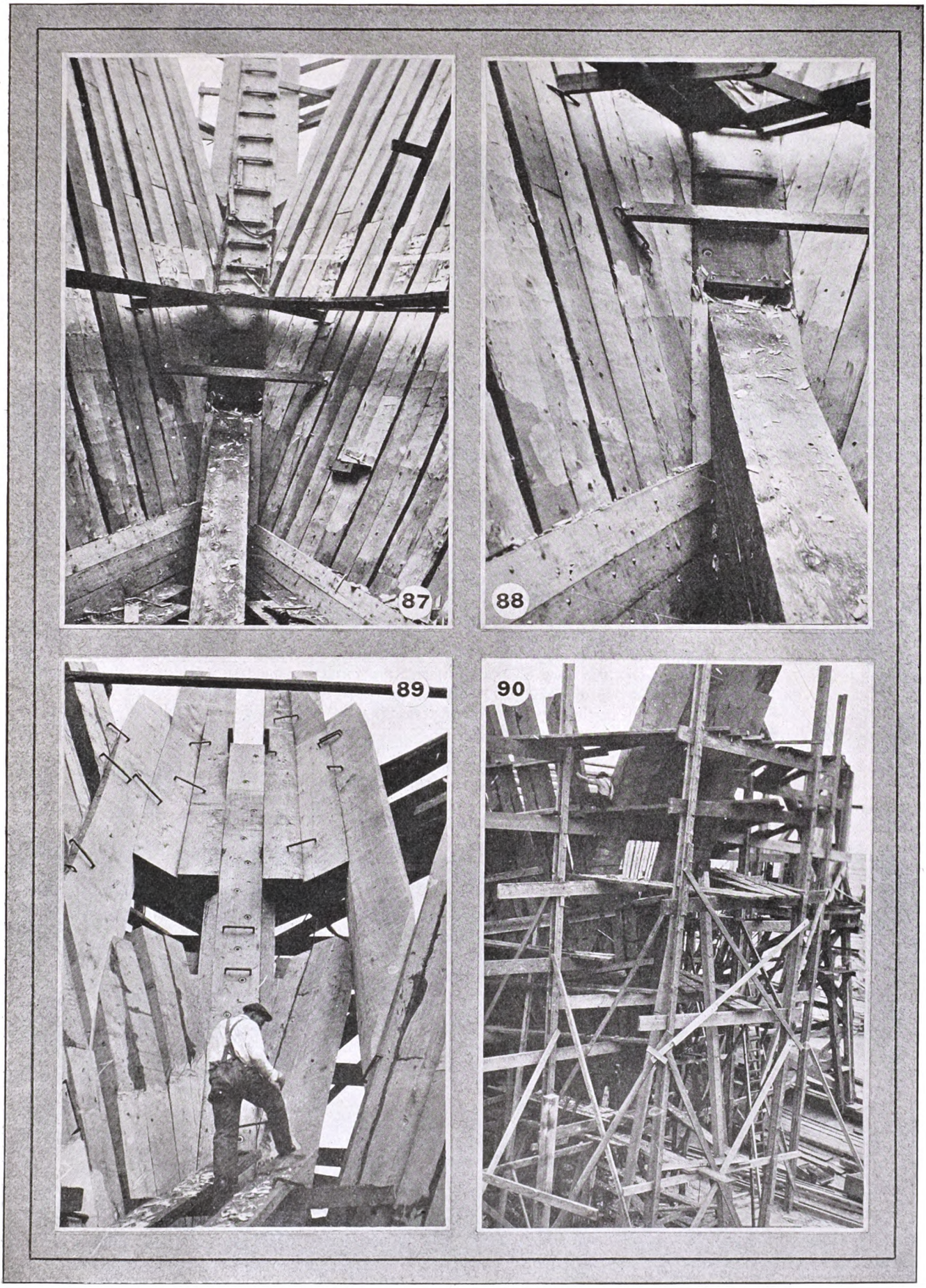


FIG. 87—INTERIOR OF BOW CONSTRUCTION OF A 290-FOOT MOTOR SCHOONER. FIG. 88—DETAIL OF STEM CONSTRUCTION OF THE SCHOONER SHOWN IN FIG. 87 ILLUSTRATING METHOD OF FASTENING FORWARD ENDS OF KEELSON TIMBERS TO STEM. FIG. 89—ARRANGEMENT OF STEM AND KNIGHTHEAD AT UPPER END NEAR MAIN DECK. FIG. 90—STAGING SURROUNDING A CLIPPER-TYPE BOW UNDER CONSTRUCTION

ter case, the knee usually is lock-scarfed, to the keel as shown.

The stem is trimmed to the proper curvature by means of molds sent from the mold-loft floor. These molds are made from the lines of the stem laid down on the floor when the sheer draft is prepared If the stem, or its counterpart, consists of more than one piece, a separate mold is made for each piece. In this case, it is a good idea to mark the waterlines on the mold, together with the two edges of rabbet and a vertical line by which to set the stem in its correct position. As many as a dozen separate molds were required for the clipper-type bows of some old English ships. At the present time, this has been reduced to two or three molds of the simplest character.

The stem usually has a tapered siding increasing uniformly from the fore end of the keel. In some cases, the taper extends to the top of the stem, while in others, when a particularly fine job is desired, three sidings are fixed, namely, at the head, midway down and at the keel.

After the stem piece is trimmed, in a manner to be described later, the several waterlines, fore edge of rabbet, bearding line and the vertical line for setting it in position, if it is of the clipper type, all are transferred to it from the molds. The rabbet is sometimes roughly cut before the stem is raised. It is advisable not to cut the rabbet to the exact depth but to leave enough wood to allow its being faired when the outside of the frame timbers are dubbed-off.

Raising the Stem

The stem, apron and knightheads are usually treenailed and bolted together before lifting them into place. For raising the stem a crane such as that employed for handling frames may be employed, or, if it is not available, a simple derrick or even nothing more than a gin pole may be used. After the stem is hoisted in place, if it is of the clipper type, its rake is proved by means of the vertical line marked upon it from the mold. It is set vertically by projecting the middle line of the keel sufficiently far forward to be below the most projecting part of the stem. Then if a plumb line, held against the middle line of stem at different heights, touches the line so produced, it is proof that the stem is vertical and free from any bulging or lateral curvature. After this fact is determined, the stem is securely shored into position. Where the stem is of the steamer type, its correct position in a transverse plane can readily be determined simply by dropping a plumb line from the upper end. The apron is really a portion of the stem, although it is distinguished from the stem proper by a separate name. Its chief function is to back-up the stem, giving it additional strength and solidity.

Deadwood, as previously mentioned, is the name given to those pieces of timber which form the lean or acute portions of the bow and stern of the ship between the extremeties and the cutting-down line, or line of the inside of timbers. This line generally bounds the upper side of the deadwood. the latter thus giving just the necessary amount of heeling for the cant timbers. But in very fine ships, the cutting-down line is sometimes on the keelsons, in order to save the great weight of timber at the extremeties caused by making the deadwood deep enough of itself to receive the abutments of the cants.

Butts Should Give Good Shift

The pieces of which the deadwood is composed are arranged in such a manner that their butts give a good shift to each other and to those of the keel. When a floor crosses the deadwood, the lip of the deadwood scarf is so situated as to receive a through bolt, and in all cases the butts and scarfs are so placed as to be in the most favorable position to receive the fastenings. In both screw and sailing ships, the pieces of deadwood ought to be tenoned into the pieces of stern post that they abut against, and the former also should be doweled and bolted together, the dowels being spaced about a room and space apart.

In some cases, a mold for the deadwood is sent from the mold-loft floor. It is made of battens upon which the joints of the several pieces composing the deadwood are marked, together with the upper edge of rabbet or bearding line, the cutting-down line of the timbers and the positions of the heels of the cants and square frames. Half-section molds of the deadwood at several square stations also may be given. These can be tacked to the main mold so as to form a part of it, in such a position that the middle line of the half-section mold coincides with the line on the mold at which the section is given. The section molds generally give the form of the rabbet and the taper, if any, of the deadwood. The deadwood may be trimmed to the taper of the keel, stem or sternpost, although usually at the present time it has parallel siding. Its siding corresponds to that of the greatest siding of that portion of the keel upon which it rests. In any case, the marks on the mold, together with the sections, give the necessary data for trimming the several pieces.

The cant frames, Fig. 96, may be secured to the keel and deadwood with bolts which pass through and secure the heels of the cants on the [illegible] side of the ship. These bolts usually are placed alternately high and low, so as to avoid the weakness caused by a line of bolt holes. Sometimes the heels of all cants are scored into the deadwood, the line of the underside of the score being termed the stepping line. This has been done in the case of the cant shown in Fig. 96. Most modern shipbuilders, however, believe this labor is unnecessary, the cants being simply heeled against the keel and deadwood, without any such stepping. In such cases, however, the thin sloping edges of the foremost cant may be cut away and a piece of batten fitted in the score cut beneath. The batten can be fastened with short spikes and lightly caulked.

It would not be out of place to insert at this point a few remarks regarding methods of trimming ship timbers. At the present time, of course, the lumber is purchased from the mill cut as nearly to size as possible. Furthermore, the shipyard usually is equipped with planing, sawing and beveling machines which are adapted to perform a great number of operations rapidly and with mechanical accuracy. In many of the smaller yards, however, the mechanical equipment is limited, and skilled men who can do the work by hand are necessary. Also, around any shipyard there should be a few men who know how to trim a timber with an axe or adz and it will be found that the services of men of this character can always be made use of.

Operation Relatively Simple

No particular skill is required in trimming timbers in a machine, other than a knowledge of the principles on which the machine is operated and of the method of setting it for the work to be performed.

In practice, the trimming of timbers by hand includes the process of "lining the log" as well as the more mechanical operation of removing the superfluous wood with axe, adz, plane, etc. It is in the former sense only that we will consider the subject, as it is this portion of the work which involves thought and ingenuity.

Nearly all of the timbers from which a ship is built are so shaped that their cross sections are quadrilaterals, generally parallelograms. Also, the majority of the timbers have their opposite sides parallel, at least two of these generally being plane surfaces. As a result of these conditions, the process of trimming the several timbers of a ship is comparatively simple, consisting of the four following principal operations:

1.—Obtaining a fair surface, generally plane, upon one side of the timber.
2.—Molding the piece by applying the molds and then marking or setting off the curvature.

FIG. 91—DETAILS OF FOREFOOT SHOWING USE OF NATURAL KNEE AND ANGLE BLOCKS. FIG. 92—ANOTHER VIEW OF THE SAME STEM. FIG. 93—SAME STEM FROM THE OPPOSITE SIDE

3.—Trimming the two sides adjacent to the first by the aid of bevellings.
4.—Setting off the fourth side, if any, parallel to the first or at any required variable distance thereform.

Since the piece of timber is supplied to the shipwright roughly in its required shape by the sawyer, the former usually can tell at a glance upon which side of the log the mold is to be applied.

A plane surface, technically termed "straight and out of winding" is obtained by striking a line along the side of the timber at the required position of the plane surface. A straight-edged batten is nailed against the end of the timber with its straight edge coinciding with the line just struck. The workmen then removed the wood above the line until the edge of a straight batten held everywhere along the trimmed surface of the timber is in the same plane as the edge of the batten nailed to the end of the timber. The battens when in the position just stated are said to be "out of winding." Incidentally, to accomplish this expeditiously requires more skill than usually is found in modern American shipyards.

A twisted surface, technically termed a winding surface, may be straight along one or both edges or may be curved; in either case, the curvature, if any, is first set off on the piece. The beveling spots also are marked and a straight-edged batten is nailed across an adjacent side at the middle beveling spot. A long-armed bevel, termed a punch bevel, is then set to the several bevelings of the twisted surface and the wooden is removed on the side which is being trimmed as far as the edge lined off, until the long arm of the bevel, when held successively at the respective spots, is out of winding with the straight-edged batten, while at the same time the stock stays against the trimmed surface, the bevel being held square to the edge.

To trim a piece of timber having

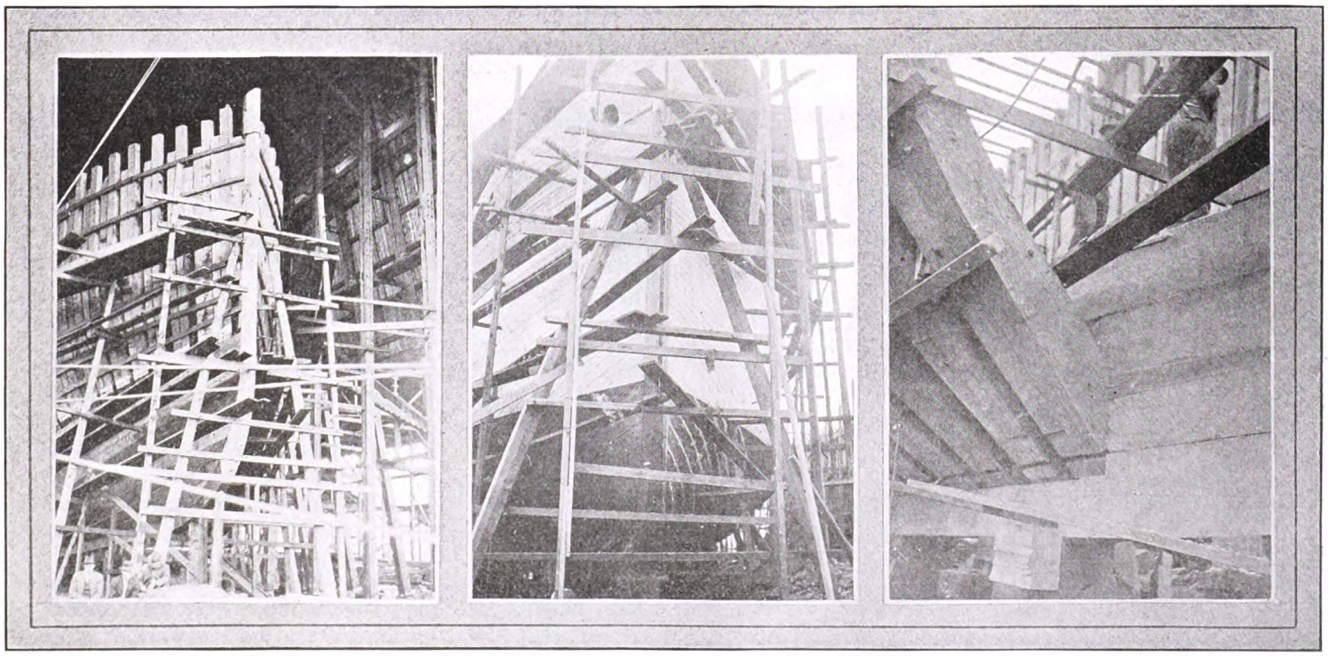


FIG. 94—STEAMER TYPE BOW UNDER CONSTRUCTION, PARTLY PLANKED. FIG. 95—STEAMER TYPE BOW FINISHED WITH STAGING STILL IN PLACE. FIG. 96—FORWARD CANT FRAMES HEELING TO DEADWOOD

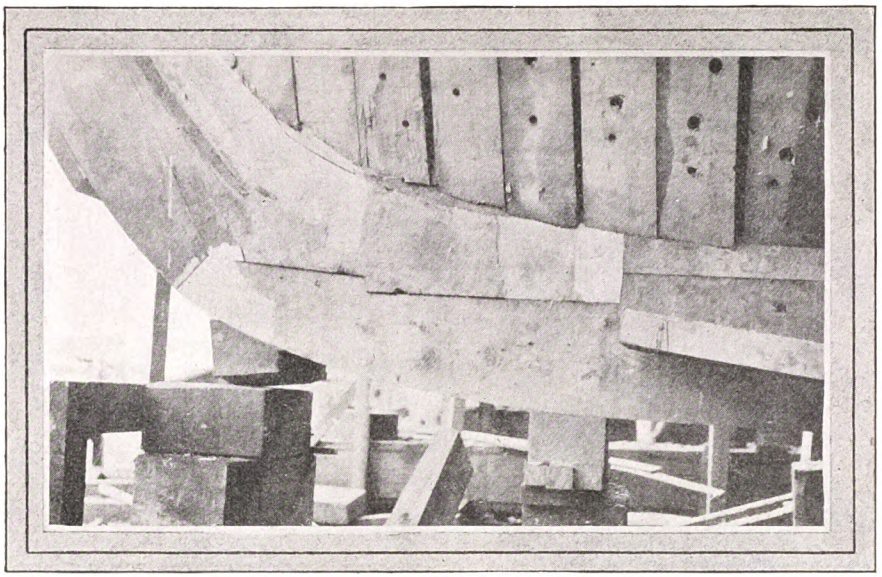


FIG. 97—DETAIL OF FOREFOOT OF CLIPPER TYPE STEM SHOWING NATURAL KNEE LOCK-SCARFED TO KEEL

straight siding and curved moldings, such as the stem or a beam, secure the piece upon blocks at a convenient height for trimming with the convex side nearest the ground. We may now proceed as follows:

Method of Procedure

Hold a straight-edged batten vertically against each end as near as possible to the side upon which the mold is to be made, so that lines joining the outer edges of the two battens, both above and below, may be everywhere within the log or timber. Adjust the battens so their edges are out of winding. Then, still looking these edges out of winding, determine points along the upper side of the timber which are in a line with the edges of the batten. Strike a line (this necessarily must be done in short lengths owing to the curvature of the side) along the upper side joining the points. This line will be one edge of the plane surface. Set off the siding of the timber from this line square to the edges of the batten and strike a line joining the siding spots; chamfer the edges away to these lines, to remove the surplus wood, with an axe or adz.

Siding the Timber

Now turn the timber over, having previously rased the positions of the battens over the ends. Repeat the operation of looking in points and lining the side, also of setting off the siding. Trim the two sides down from these lines to the chamfered edges. We thus have two plane sides to the timber, and if the sidings are uniform, the sides are also parallel. In its present state the timber is said to be sided.

This is one method of performing the operation. Others will occur to the experienced man. In modern wooden

FIG. 98—ARRANGEMENT OF FLOORS, KEELSON AND STEM OF A VESSEL UNDER CONSTRUCTION AT A GULF SHIPYARD

FIG. 99—DETAILS OF STEM AND FORWARD FRAME CONSTRUCTION OF A MOTOR SCHOONER UNDER CONSTRUCTION ON THE GULF

shipyards, however, it is seldom necessary to resort to this rather elaborate process of siding a timber, machinery usually being available. However, as previously stated, it is well to know how the operation may be performed by hand.

For molding the curved shape of the timber, a mold is furnished from the mold loft. It is laid on the molding or joint side of the timber, being kept sufficiently *on* the surface to allow wood for obtaining the necessary beveling. Also due regard is had for the required length of the timber. In some cases, when concave curvature is given for convex timbers, as cant molds, for instance, the mold is held *off* the timber and the curvature is then copied by spiling. When the curvature is rased in and the positions of the beveling spots transferred, the mold is removed, the moldings of the timbers are set off, a

thin batten is set so it can pass fairly through the spots and the line so found is rased in.

Now set a bevel to each of the successive bevelings of the piece and apply the bevel to the molded edge, square to the curve and to the edge of the timber at the respective beveling spots. Hold the bevel so its tongue just touches the timber; measure with a pair of compasses the distance between the tongue and the molded edge and set this distance in upon the timber on the opposite side, measuring from the tongue. Bend the thin batten so as to pass through all of the points so obtained on the side opposite to the molded side, and rase in the line.

Trim the Curved Side

Now trim down the curved side of the timber straight from line to line, and the outer surface of the timber will be to its required state. The inside surface is trimmed parallel to the outer through the line obtained by setting off the molded scantlings. Frame timbers, beams, stem, apron, deadwood, sternposts of screw ships, etc., may be trimmed in this way if no machinery is available. A band-saw, however, as described in the previous chapter, is the proper tool to use for operations of this character. A knowledge of the method of marking, however, is just as necessary as if the work were to be done by hand.

A timber with straight siding and molding is trimmed by a simple and obvious modification of the methods just described. It is evident that the only difference consists in striking straight lines upon the plane surface instead of marking with a curved mold.

Fig. 83, in addition to illustrating the method of framing the bow and working up the stem of a clipper-type ship, also shows the staging which must be erected to give access to the sides of the ship during construction. This staging is similar to that used in house construction. The posts or stanchions usually are provided with holes bored about every foot so that the stringers which upon the staging rests may be set at convenient heights. These holes also make it easy to take the staging down or to move it.

Figs. 87 and 88 show how the forward ends of the keelson are fastened to the stem, particularly in ships provided with heavy center girder-keelsons. It will be noted that the keelson timbers are securely bolted to the stem. These illustrations also show how the ceiling fays against the forward end of the center girder keelson.

A method of fastening the stem of a vessel to the keel without the use of a natural knee is shown in Fig. 85, illustrating the practice of a Gulf coast shipyard. It will be noted that in this case straight pieces of timber, suitably beveled at the ends, are inserted in place of the knee usually set in the corner formed by the keel and stem. This type of construction should be contrasted with that in which a knee is used, as illustrated in Fig. 97.

A well known method of working out the stem-to-keel connection in the case of a steamer type bow is illustrated in Figs. 91, 92 and 93. It will be noted that a natural knee is used to form the nose or forefoot of the ship and that the deadwood is reinforced by angle-blocking placed in the corner between the stem and the upper part of the deadwood. These illustrations also show clearly how the rabbet must be cut in the stem to receive the forward ends of the planking. More general views of a stem of this type in finished and semifinished states are shown respectively in Figs. 94 and 95.

Still another form of stem, using a very large natural knee in the angle, is illustrated in Fig. 84. A detailed drawing of this stem is presented in Fig. 86. This drawing shows the nature and disposition of the fastenings together with the arrangement of the stem, keel, apron, deadwood, knee, etc. The drawing should be studied carefully. Cross sections of the stem, apron, knighthead and forward frames at various waterline elevations are shown on the drawing. It will be noted that two rabbets are provided, this ship being triple planked with an inner skin of double diagonals and an outer skin of ordinary horizontal planking. The large wooden knee set in the angle of the stem is sided 19½ inches. The horizontal leg of this knee is 11 feet in length, the vertical leg being 8 feet. Half frames Nos. 1, 2 and 3, Fig. 86, are boxed in the keelson and deadwood to the sidelines of the knee. Half frames Nos. 4, 5, 6 and 7 are boxed in 2 inches at the keel only. Limber holes are left at the heels of all the half frames. The half frames are screw fastened with two 1-inch clinch bolts in each timber.

Raise Lake Wages

The following new wage schedule has been adopted by the Lake Carriers' association, effective Oct. 1:

	Per month.
Boatswains	$105
Stewards on vessels over 4000 gross tons	130
Stewards on vessels under 4000 gross tons	115
Second cooks	70
Waiters	60
Porters	60
Firemen, oilers and water tenders	95
Wheelsmen and lookoutmen	95
Ordinary seamen	60
Coal passers	60

The question of wages for captains, engineers and mates was not taken up at the recent meeting of the wage scale committee, but it was decided that an adjustment of the salaries of licensed officers would be made.

Soo Canal Report

The commerce carried through the Soo canal in September aggregated 13,544,686 net tons, a drop of 422,422 net tons from August when 13,967,108 net tons passed through this waterway. The September figure, however, exceeded the mark set in September of last year when 12,906,524 net tons were carried. Last month's movement also fell below the total for July of this year when 13,650,047 net tons were handled. The total freight movement through the Soo canal up to Oct. 1 totals 63,453,186 net tons, against 68,455,497 net tons carried in the corresponding period last year, a decline of 5,002,311 net tons. This decline compares with 5,640,473 net tons up to Sept. 1; 5,576,319 net tons up to Aug. 1; 5,177,962 net tons up to July 1, and 5,442,656 net tons up to June 1.

Of the September movement, 11,820,479 net tons passed through the American canal and 1,724,207 net tons passed through the Canadian canal. The eastbound movement aggregated 9,899,665 net tons and the westbound movement 3,645,021 net tons. The eastbound iron ore movement totaled 9,298,811 net tons against 10,212,856 net tons in August. The westbound coal movement in September was 3,463,814 net tons, a big increase over August.

The detailed report of the Soo commerce up to Oct. 1, 1917 and Oct. 1, 1916, follows:

EASTBOUND

	To Oct. 1, 1916	To Oct. 1, 1917
Flour, barrels	6,533,889	5,070,909
Wheat, bushels	156,735,884	94,767,506
Grain, bushels	61,318,486	49,167,309
Copper, net tons	83,669	87,325
Iron ore, net tons	47,370,170	44,775,328
Pig iron, net tons	29,696	5,724
Lumber, M. ft. B. M.	251,399	268,615
Gen. merch., net tons.	221,984	178,946
Passengers, number	27,126	18,394

WESTBOUND

Flour, barrels	13,230	80
Grain, bushels	4,710	1,925
Coal, hard, net tons	1,609,481	1,820,609
Coal, soft, net tons	11,030,178	10,768,534
Iron ore, net tons	28,927	57,647
Mfctd. iron, net tons	116,441	75,822
Salt, barrels	572,489	420,493
Gen'l merch., net tons	837,873	889,984
Passengers, number	26,384	19,085

SUMMARY

Vessel passages, No.	18,845	16,386
Regis. tonnage, net	51,701,240	46,742,398
Freight:		
Eastbound, net tons	54,645,624	49,778,016
Westbound, net tons	13,809,873	13,675,170
Total frght., net tons	68,455,497	63,453,186

Specifications for U. S. Steel Ship

Complete Description of the Hull Engineering Specifications and the Furnishings for Standard 7300-Ton Steel Steamer for Emergency Fleet Corp.

IN THE October issue of THE MARINE REVIEW, complete specifications for the hull and propelling machinery of the shipping board's standard steel steamer were presented. The following shows the hull engineering specifications and the furnishings:

Hull Engineering Specifications
(To be in Accordance with Rules of American Bureau of Shipping and United States Inspection Laws)

1. Windlass

To be of spur-geared type of approved size and make, with windlass and engine located on forecastle deck. The windlass will be fitted with quick-acting warping attachment. Suitable chain stoppers will be furnished. The windlass to be bedded on pitch pine 4 inches thick, with plate under, and thoroughly bolted down on chocks between the beams, and well supported by stanchions.

2. Steam Gypsy

A reversible steam gypsy about 8 x 8 inches will be supplied and located on the poop deck aft. The engine will be located on the upper deck. The vertical shaft will be fitted with a drum for emergency steering.

3. Steam Winches

Winches of approved make as follows: Eight single-geared single-drum and two compound-geared single-drum; six of the single geared and the two compound geared will have cylinders about 8¼ x 10 inches; two of the single geared will have cylinders about 6¼ x 8 inches. Each winch will have two gypsy heads, about 12 inches diameter and 7¼ inches diameter for the large and small winches, respectively. Winches to be placed on suitable beds to allow a clear lead from winch barrel over hatch coamings.

4. Watertight Door

There will be one 45 x 20-inch horizontal sliding watertight door at the entrance to the shaft alley.

5. Hand Pumps

There will be one double-acting hand pump placed on deck with suction from bilge system and sea and discharge overboard and to fire hose, in accordance with American bureau of shipping and United States steamboat inspection service rules, and two hand force pumps with 1¼-inch suction will be installed forward for firemen's and sailors' sinks.

6. Steering Gear

The steering gear will be of the right and left hand screw type with telemotor control from the pilot house and bridge and with a cast iron steam steering stand fitted on the poop deck. The steering wheels amidships and on poop deck will be teak. There will be a tiller arranged to be connected to the drum on the after capstan for emergency steering.

7. Plumbing

Water closets, bath and connections for main cabin, officers and crew to be fitted as shown on accompanying plan; also piping to fresh water tanks, which is to be of galvanized iron. A 200-gallon fresh water tank, filled by fresh water pump in engine room, to be fitted to supply amidship officers' quarters.

8. Sanitary System

The sanitary piping will be galvanized iron and will be arranged in accordance with plans.

9. Heating System

Steam pipes with cast iron wall radiators for heating the various rooms will be fitted. A steam pipe will be led into galley sink and to steam table. The piping will be of black iron. Connections will be taken from the heating systems for heating the bath water.

10. Fire Main

To be of galvanized iron, 2½ inches, and fitted along one side of ship, with brass hose valves at intervals for attaching hose. The fire main to connect to aft peak for filling.

11. Fire and Deck Wash Hose

Three hundred feet of 2½-inch and 100 feet of 1½-inch rubber-lined cotton fire and deck-wash hose, fitted with couplings to connect with the fire main, together with the necessary nozzles and spanners, will be furnished. Tanks under Nos. 1, 2, and 3 holds and under engine and boiler rooms to be used for fuel oil, but will be arranged for flooding from sea by providing portable connections at manifolds in machinery space.

12. Water Ballast and Drainage

The piping to inner bottom tank No. 4 will be of suitable size for oil and so arranged that that tank can be used at some future time, at a minimum expense, for carrying fuel oil; the necessary changes for oil to be effected by shifting the connections at the manifold in the shaft alley, in which case the after peak tank will be used fresh water, blank connections being provided for this purpose.

Suction pipes to midship tanks carried into iron strums. Pipes to be led so as to be easily cased with wood where necessary. The fore and after peaks to be fitted as water-ballast tanks and to be filled by the fire main. The after peak to be connected to the ballast-pump system by a 3-inch suction pipe. The suction pipes to the well at aft end to be 3½ inches diameter. The fore peak to be connected by a 3-inch pipe to the ballast manifold. The fore peak to be arranged for carrying fresh water if desired. The ballast and bilge piping will be wrought iron, galvanized, with lead bends and drops into the bilges. The flanges will be galvanized after the pipe is made up.

13. Air and Sounding Pipes

Air pipes, 2 inches diameter, will be fitted at the forward end of each compartment, except in way of oil tanks, where they will be 2½ inches; 1½-inch diameter sounding pipes will be fitted for sounding all ballast tanks, fresh water tanks, and peaks. Air and sounding pipes will be of galvanized iron.

14. Smothering Pipes

Steam smothering pipes will be fitted as required by United States inspection laws. Smothering pipes will be standard wrought iron pipe, black.

15. Refrigerating Machine

A 1-ton refrigerating machine, direct expansion ammonia type, of approved make, will be installed. A 4½ x 3¾ x 4 inch horizontal duplex pump to be provided in the engine room for ammonia-condenser circulation. No provision will be made for ice making. There will be one 40-gallon scuttle butt, complete, with insulation and galvanized coil. The scuttle butt will be supplied from the gravity fresh water tank.

16. Generating Set

There will be one generating set of 15-kilowatt capacity. This set will be able to carry 20 per cent overload for half an hour without injury; it will be automatic and govern both speed and voltage within a range of 4 per cent. The maximum voltage of this set will be 125.

17. Switchboard

There will be a main switchboard of black enameled slate, on which will be mounted the following:

One main generator switch, 150-ampere capacity.

Suitable number of distribution switches.

One generator field rheostat, handle in front of board.

One ammeter, 120-ampere scale.

One voltmeter, 150-volt scale.

One lighting fixture.

Voltmeter switch for testing generator and "grounds".

All switches will be double pole fused and one extra set of fuses will be supplied.

18. Wiring

The wiring in all freight spaces, engine and fire rooms, and all places exposed to the weather and moisture will be run in conduit. In deck houses, staterooms, etc., wooden molding will be used to conform to surrounding joiner work. Water-tight junction boxes with standard interior fittings will be used on all conduit wiring. At suitable locations watertight receptacles will be placed to which portables may at any time be connected. The best quality marine insulated wire will be installed, the sizes of which will be so proportioned that the drop of potential from the switchboard to the farthest lamp will not exceed 3 per cent. No solid wire larger than No. 12 B. & S. gage will be used.

All wire and wiring will meet the inspection and approval of the national board of fire underwriters.

19. Fixtures

Steam-tight globes with guards will be installed in engine room, fire room, freight spaces, and all places exposed to moisture and the weather. For staterooms, etc., special type of fixtures will be installed. Four hand portables and six cargo reflectors, each with necessary cable and attaching plug, will be furnished. Electric running lights, consisting of masthead, range, and two side lights, will be installed, the side lights being arranged for both electricity and oil. One masthead and two side lights will be controlled by a running light indicator located in the pilot house. All fixtures will be supplied with the necessary lamps, the voltage of which will be 110. The total number of 16 candlepower lamps installed will be about 200, as per plan to be approved by owners.

20. Searchlight

A 14-inch searchlight, mounted on sub-base and with pilot house control, will be provided and installed on top of pilot house. This searchlight will have separate circuit from switchboard and the leads which are exposed to the weather will run in conduit. A switch will be installed at the light for the purpose of turning it on and off.

21. Telegraph

Mechanical reply telegraph with illuminated dial to be fitted from bridge to engine room and flying bridge. One telegraph stand on bridge and one on flying bridge.

22. Interior Communication

There will be installed the following means of interior communication:

Mechanical telegraph transmitters on bridge and in pilot house to indicator in engine room.

1½-inch voice tube from engineer's stateroom to engine room.

1½-inch voice tube from bridge to pilot house.

1½-inch voice tube from pilot house to engine room.

1½-inch voice tube from standard compass to check compass.

1½-inch voice tube from pilot house to radioroom.

1½-inch voice tube from pilot house to crow's nest.

Steam whistle gear on bridge and in pilot house.

Electric call bell from pilot house to crow's nest.

Electric alarm bells in crow's quarters to meet inspection laws.

An electric bell in captain's and mate's staterooms and push button in pilot house.

Furniture, Etc.

1. Seamen's Quarters

Eight metal pipe berths, standee type, with spring bottoms.

Eight metal lockers.

Two seats 5 feet long.

One mirror.

One toilet rack.
Eight hat and coat hooks.

2. Firemen's Quarters

Eight metal pipe berths, standee type, with spring bottoms.
Eight metal lockers.
Two seats 6 feet 6 inches long.
One mirror.
One toilet rack.
Ten hat and coat hooks.

3. Gun Crew Quarters

Twelve metal pipe berths, standee type, with spring bottoms.
Twelve metal lockers.
Two seats.
Two mirrors.
Two toilet racks.
Twelve hat and coat hooks.

4. Carpenter's and Boatswain's Room

Two metal berths with spring bottoms.
Two drawers under berths.
Two metal lockers.
Seat.
Drop-leaf desk.
Stool.
Lavatory.
Mirror.
Toilet rack.
Four hat and coat hooks.

5. Quartermasters' Room

Three metal berths with spring bottoms.
Three metal lockers.
Seat.
Drop-leaf desk.
Stool.
Lavatory.
Mirror.
Toilet rack.
Four hat and coat hooks.

6. Captain's Room

Built-in berth with two drawers under.
Transom seat with two drawers—extension.
Built-in locker.
Bookrack, oak.
Flattop desk.
Morris chair, oak.
Four hat and coat hooks.
Revolving desk chair.

7. Spare Rooms

Each to have—
Built-in berth, two drawers under.
Transom seat, two drawers under.
Built-in locker.
Lavatory.
Mirror.
Toilet rack.
Six hat and coat hooks.

8. Wireless Room

Two metal berths with spring bottoms.
Built-in locker.
Transom seat, two drawers under.
Instrument table.
Lavatory.
Mirror.
Toilet rack.
Six hat and coat hooks.

9. First Officer's Room

Built-in berth, two drawers under.
Built-in locker, drawers under.
Transom seat, two drawers under.
Thirty-four-inch drop-leaf desk.
Bent-wood desk chair.
Keyboard.
Lavatory.
Mirror.
Toilet rack.
Three hat and coat hooks.

10. Second and Third Officers' Rooms

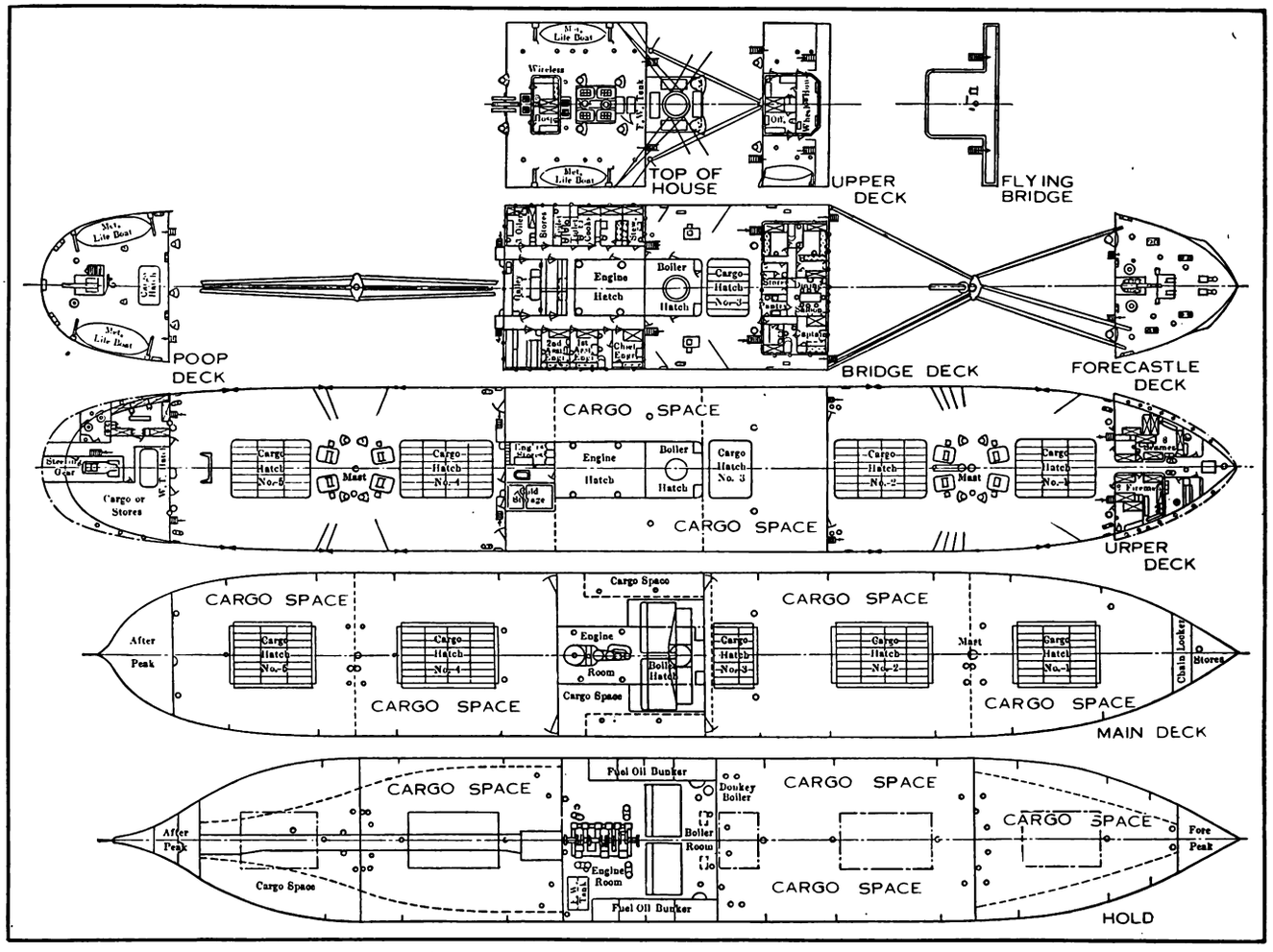
Each to have—
Built-in berth, two drawers under.
Built-in locker.
Transom seat, two drawers under.
Drop-leaf desk.
Lavatory.
Mirror.
Toilet rack.
Three hat and coat hooks.

11. Dining Saloon

One oak table (7 feet x 36 inches) with rack.
Eight revolving oak chairs.
Two built-in chiffonieres.
One two-light oil chandelier.
Mirror.
One 8-day clock, nickel case, 6-inch face.
One medicine chest fitted with filled bottles.
One inkstand.
Shelf with brass pan for water cooler.
Sixteen hat and coat hooks.

12. Saloon Pantry

One steam table (3 feet x 21 inches) furnished with one 20-inch planished platter and four enameled soup and vegetable dishes, to set in top of dresser.
One 20 x 16 x 12-inch sheet-lead sink with drain board.



PROFILE AND DECK PLANS OF STANDARD STEEL STEAMER FOR THE GOVERNMENT

13. Chief Engineer's Room

One built-in berth, two drawers under.
Transom seat, two drawers under.
Built-in locker.
Flat-top desk.
Revolving desk chair, oak.
Keyboard.
Bookrack over berth.
Lavatory.
Mirror.
Toilet rack.
Four hat and coat hooks.

14. First Assistant Engineer's Room

Built-in berth and two drawers.
Transom seat with two drawers.
Built-in locker.
Drop-leaf desk.
Bent wood desk chair.
Keyboard.
Bookrack over berth, oak.
Lavatory.
Mirror.

Toilet rack.
Three hat and coat hooks.

15 Second and Third Assistant Engineers' Rooms

Each to have—
One built-in berth, two drawers under.
Built-in locker.
Transom seat, with two drawers under.
Drop-leaf desk.
Lavatory.
Mirror.
Toilet rack.
Three hat and coat hooks.

16. Steward's Room

Built-in berth, drawer and locker under.
Transom seat, two drawers under.
Built-in locker.
Keyboard.
Lavatory.
Mirror.
Toilet rack.
Three hat and coat hooks.

17. Oiler's Room

Three metal berths with spring bottoms.
Drawers under berths.
Three metal lockers.
Seat with locker under.
Lavatory.
Mirror.
Toilet rack.
Five hat and coat books.

18. Cooks' and Boys' Rooms

Each to have—
Two metal berths, spring bottoms.
Two drawers under berths.
Two metal lockers.
Seat with locker under.
Lavatory.
Toilet rack.
Six hat and coat hooks.

19. Officers' Firemen's, and Seamen's Mess Rooms

Tables and benches as indicated on plan.

20. Wheel House

Flag locker.
Drop leaf desk.

21. Chart Room

Built-in berth with drawer and locker under.
Two built-in lockers, one fitted with galvanized iron drip pan for oilskins.
Chart table with two drawers.
Book rack.
Chronometer box.
Keyboard.
Transom seat.
One revolving chair, oak.
Lavatory.
Six hat and coat hooks.
Mirror.
Toilet rack.

22. Hospital

Four metal berths.
Lavatory.

23. Miscellaneous Furniture

Each metal locker will be fitted with a shelf four coat hooks, and a padlock. Wooden lockers will each have a shelf and six coat hooks.

The captain's and chief engineer's berths will have a spiral wire spring; all other built-in berths will have woven wire springs on steel frames.

There will also be supplied the following:
Six camp stools.
Four coir mats.
Sixteen bracket oil lamps with smoke bell and holder.

24. Upholstery

The following will be upholstered in curled hair and fabrikoid, all to be tufted:

Transom seats and backs in chart room, captain's and chief engineer's staterooms, and spare room.

Transom seats in first officer's room, second and third officers' rooms, steward's room, wireless room, first assistant engineer's room, and second and third assistant engineers' rooms.

Revolving chairs in dining saloon.
Morris chair in captain's room.

25. Outfit and Equipment

The folowing articles will be furnished and installed by the builders:

One galley range, 7 feet long, two fire boxes, two ovens, and double plate shelf.
One hot water boiler, 40 gallons, with brass tap, attached to range.
One poker.
One shovel.

26. Cook's Stores

One copper boiler.
One steamer.
Six saucepans.
Two frying pans.
Four bake pans.
One sea pie pan.
Two gridirons.
One colander.
One knife board and box.
One tormentor.
One blackjack.
One iron kettle, 1 gallon.
One ladle.
One cook's saw, 18-inch.
One cook's axe.
One pasteboard and box.
One potato beater.
One rolling pin.
One galley knife and fork.
One dredger.
One large spoon.
One flour sieve.
One mincing knife.
One mincing machine.
One chopping knife.
One toasting fork.
One steel.
One oval pan, large.
Two water tins.
Two pails, galvanized.

27. Cabin Stores

Two cabin brushes.
One hand brush.
One clothes brush.
One black-lead brush.
One set shoe brushes.
Two brass cuspidors.
Four cleaning pans.
One dustpan.
One cabin bell.
One stone water cooler and filter, 4 gallons.
One tin tea canister, 10 pounds.
One tin coffee canister, 10 pounds.
One copper teakettle.
One tin teapot.
One tin coffeepot.
One coffee mill.
Two bread trays.
Two tea trays.
One knife basket.
One plate basket.
One nutmeg grater.
Two corkscrews.
One treacle bottle.
One sugar box.
One candle box.

28. Officers' Mess Outfit

One stone water cooler and filter, 4 gallons.
One block tin teapot.
One block tin coffeepot.
One large tin kettle.
One mustard pot.
One pepper box.
One salt box.
One japanned cruet frame and bottles.
One soup tureen and ladle.
Six tablespoons, white metal.
Six dessert spoons, white metal.
Six teaspoons, white metal.
Six egg spoons, white metal.
Two saltspoons, white metal.
Six black handled knives and forks.
Two pairs black handled carvers.
One steel.
Six tumblers.
Six cups and saucers, tea.
Six half-pint mugs.
Six vegetable dishes.
Six soup plates.
Six dinner plates.
Six pudding plates.
One butter dish.
One sugar basin.
One cream jug.
Two cuspidors, enameled.

29. Cutlery and Plated Ware

One teapot, 1 quart.
One coffeepot, ½ gallon.
One sugar basin.
One cream jug, ½ pint.
One cruet stand, 6 glasses.
One toast rack.
One soup tureen.
One soup ladle.
One sauce ladle.
One set dish covers.
One dozen table forks.
One dozen dessert forks.
One pickle fork.
One dozen tablespoons.
One dozen teaspoons.
One dozen dessert spoons.
Six egg spoons.
Two saltspoons.
Two mustard spoons.
One sugar spoon.
One gravy ladle.
One pair sugar tongs.
One dozen table knives.
One dozen dessert knives.
Two pairs carvers.
One table steel.

30. Glass and China Ware

One water bottle and two tumblers for each room.
Twelve tumblers.
Two saltcellars.
One sugar basin.
Twelve meat plates, 10 inches.
Twelve soup plates, 10 inches.
Twelve pudding plates, 8 inches.
Twelve cheese plates, 6 inches.
Six dishes, assorted platters.
Six baking dishes.
Two covered dishes, vegetable.
Two sauce tureens.
Two sauce boats and stands.
Twelve breakfast cups and saucers.
Twelve teacups and saucers.
Twelve breakfast plates.
Twelve tea plates.
Six egg cups.
Six basins.
Two butter dishes.
Two cream jugs.
Six jugs.
Two hot-water jugs.
Six half-pint mugs.
Two slop basins.

31. Navigating Outfit

One Lord Kelvin compensating binnacle and compass with azimuth for top of wheelhouse. (American make will be substituted if imported binnacle is not obtainable.)

One compensating binnacle and Ritchie compass for wheelhouse.

One binnacle and compass for after-steering station.

Two boat compasses.

All compasses will be properly adjusted by builders.

One patent log and line.
One deep sea lead and line.
Two hand leads and lines.
One patent sounding machine.
One mechanical foghorn.
One megaphone.
One Aneroid barometer.
One wheelhouse clock, 8-day, ship's bell strike.
Two pairs binocular glasses.
One box for binoculars.
One log slate.
Two black canvas balls.

32. Bells

One 12-inch ship's bell engraved with name for forecastle.
One 6 inch officers' bell.

33. Flags

Two ensigns, 10 feet 8 inches by 16 feet.
One jack, 7 feet 6 inches x 10 feet 6 inches.
One house flag, 10 feet x 6 feet.
One burgee, 18 feet.
One quarantine, 10 feet x 7 feet 6 inches.
One set of commercial-code signals and book.

34. Signal Lights

Two oil anchor lights.
Two oil ruby-globe signal lights.
One oil stern light.
One oil masthead light.
Two combination oil and electric side lights.
One electric masthead light.
One electric range light.

35. Miscellaneous Outfit

Twelve life rings with ship's name (four with water lights).
Fifty-two life preservers.
Two fire extinguishers.
Eight fire axes.
Twenty-five fire buckets.

36. Deck Outfit

One rope side ladder.
Two hold ladders with pipe rounds.
Six cork fenders.
Two pairs luff tackle blocks.
Four rail grips.

37. Cooper's Stores

One water funnel.
One tar bucket.
One draw bucket.
One steep tub.
Four mess kits.
Twelve deck buckets, galvanized iron.

38. Carpenter's Stores

One pitch pot and ladle.
One grindstone, spindle, and trough.

Two claw hammers.
One adze.
One maul.
One handsaw.
One carpenter's ax.
One shifting screw key.
One shifting key for deck valves.
Two sounding rods.
One pump hook.
One set punches and chisels.

39. Boatswains' Stores

One spring balance to weigh 112 pounds.
One set weights and scales to weigh 28 pounds.
One copper water dipper.
Three brass padlocks.
Two crowbars.
Six marline spikes.
Six chain hooks.
Four bale hooks.
One pair can hooks.
Six chisel scrapers.
Four rolling fenders.
Six handspikes.
Two serving mallets.
Two serving boards.
Four boards and blocks for funnel stage.
Twelve paint brushes.
Nine coal shovels, round mouthed.
Six paint scrubbers.
Six deck scrubbers.
Twelve coir brooms and handles.
Twelve mops and handles.
Six long tar brushes.
Six short tar brushes.
Six triangular scrapers.
Four cold chisels.

40. Lamp and Paint Room Outfit

Two oil tanks, 50 gallons each, with brass taps.
Two oil tanks, 25 gallons each, with brass taps.
One waste tank.
Two oil cans, 1 gallon.
Two oil funnels, ¼ quart and ½ quart.
Two oil bottles, 3 gallon jacket cans.
One set tin measures.
Two oil feeders, 2 quarts.
Four tomahawks.
One pair lamp scissors.
Four 9 x 13 inch guarded galvanized lanterns for hold.
Two 9 x 13 inch guarded galvanized lanterns for forecastle.
One 9 x 13 inch guarded galvanized lantern for galley.
Two galvanized-iron petticoat lamps for storeroom.
Two galvanized-iron deck hand lanterns.

41. Boats and Life Rafts

Metallic boats and life rafts will be supplied, complete with outfit, as required to pass United States inspection laws for service, through the war zone.
One wooden yawl, 16 feet long, 5 feet beam, 2 feet deep.

42. Anchors and Cables

Two stockless bower anchors, each 7665 pounds.
One stockless stream anchor, 2765 pounds.
One stockless kedge anchor, 1155 pounds.
Two lengths 2¼-inch stud link chain cable, each 135 fathoms, in 1-45 fathom and 3-30 fathom shots, with necessary chain and anchor shackles.
One spare cable shackle.
One stream line, 90 fathoms, 4½-inch circumference galvanized-steel wire on reel.
One towline, 120 fathoms, 5-inch circumference galvanized-steel wire on reel.
One hawser, 90 fathoms, 3-inch circumference galvanized-steel wire.
Two manila hawsers, 90 fathoms, 8-inch circumference.
Two manila warps, 90 fathoms, 7-inch circumference.

43. Captain's Room

One elastic felt mattress.
Two feather pillows.
Twelve sheets, 72 x 108 inches.
Eight pillowcases.
Six towels.
Two pair blankets, plaid, one black, one brown.
Three counterpanes, white.
One mattress cover.
Two pillow covers.

44. Spare Rooms

Two elastic felt mattresses.
Four feather pillows.
Twelve sheets, 54 x 108 inches.
Six pillow cases.
Six towels.
Two pair blankets, plaid, one black, one brown.
Three counterpanes, white.
Two mattress covers.
Four pillow covers.

45. Chart Room

One elastic felt mattress.
Two feather pillows.
Twelve sheets, 54 x 108 inches.
Six pillow cases.
Six towels.
Two pairs blankets, plaid.
Three counterpanes, colored.
One mattress cover.
Two pillow covers.

46. Chief Engineer's Room

One elastic felt mattress.
Two feather pillows.
Twelve sheets, 63 x 90 inches.
Six pillow cases.
Six towels.
Two pair blankets, plaid.
Three counterpanes, colored.
One mattress cover.
Two pillow covers.

47. First Officer's Room

One elastic felt mattress.
Two feather pillows.
Twelve sheets, 54 x 90 inches.
Six pillow cases.
Six towels.
Two pair blankets, plaid.
Two counterpanes, colored.
One mattress cover.
Two pilow covers.

48. Second Officer's Room

One felt mattress.
Two feather pillows.
Six sheets, 54 x 90 inches.
Six pillow cases.
Six towels.
Two pair blankets, plaid.
Two counterpanes, colored.
One mattress cover.
Two pillow covers.

49. Third Officer's Room

One felt mattress.
Two feather pillows.
Six sheets, 54 x 90 inches.
Six pillow cases.
Two pair blankets, plaid.
Two counterpanes.
Six towels.
One mattress cover.
Two pillow covers.

50. Wireless Room

Two elastic felt mattresses.
Four feather pillows.
Twelve sheets, 54 x 90 inches.
Twelve pillow cases.
Twelve towels.
Four pairs blankets, colored.
Four counterpanes.
Two mattress covers.
Four pillow covers.

51. Steward's Room

One felt mattress.
Two feather pillows.
Six sheets, 54 x 90 inches.
Six pillow cases.
Two pairs blankets, plaid.
Two counterpanes, colored.
Six towels.
One mattress cover.
Two pillow covers.

52. First Assistant Engineer's Room

One felt mattress.
Two feather pillows.
Six sheets, 54 x 90 inches.
Six pillow cases.
Two pairs blankets, plaid.
Two counterpanes, colored.
Six towels.
One mattress cover.
Two pillow covers.

53. Second Assistant Engineer's Room

One felt mattress.
Two feather pillows.
Six sheets, 54 x 90 inches.
Six pillow cases.
Two pairs blankets, colored.
Two colored bedspreads.
Six towels.
One mattress cover.
Two pillow covers.

54. Third Assistant Engineer's Room

One felt mattress.
Two feather pillows.
Six sheets, 54 x 90 inches.
Six pillow cases.
Two pair blankets, colored.
Two colored bedspreads.
Six towels.
One mattress cover.
Two pillow covers.

55. Three Oilers

Three felt mattresses.
Three feather pillows.
Twelve sheets, 54 x 90 inches.
Six pillow cases.
Six pair blankets, colored.
Six colored bedspreads.
Twelve towels.
Three mattress covers.
Three pillow covers.

56. Three Quartermasters

Three felt mattresses.
Three feather pillows.
Twelve sheets, 54 x 90 inches.
Six pillow cases.
Six pair blankets, colored.
Six colored bedspreads.
Twelve towels.
Three mattress covers.
Three pillow covers.

57. Two Boatswains

Two felt mattresses.
Two feather pillows.
Eight sheets, 54 x 90 inches.
Four pillow cases.
Four pair blankets, colored.
Eight towels.
Two mattress covers.
Two pillow covers.
Four colored bedspreads.

58. Two Cooks and Two Boys

Four felt mattresses.
Four feather pillows.
Sixteen sheets, 54 x 90 inches.
Eight pillow cases.
Eight pair blankets, colored.
Sixteen towels.
Four mattress covers.
Four pillow cases.
Eight colored bedspreads.

59. Eight Firemen

Eight mattresses.
Eight pillows.
Sixteen sheets, colored.
Sixteen pillow cases, colored.
Eight colored blankets.

60. Eight Sailors

Eight mattresses.
Eight pillows.
Sixteen sheets, colored.
Sixteen pillow cases, colored.
Eight pair colored blankets.

61. Twelve Gun Crew

Twelve mattresses.
Twelve pillows.
Twenty-four sheets, colored.
Twenty-four pillow cases, colored.
Twelve pair colored blankets.

62. Linen, Etc.

Four dozen napkins for cabin.
Ten table cloths for cabin.
Three table cloths, officers' mess.
Four dozen napkins, officers' mess.
Six dozen roller towels, 3 yards each.
Four dozen bath towels.
Six dozen dish towels.
One tapestry table cover for saloon table.
Five curtains for chart house windows.
Twenty-seven airport curtains, rods, and fixtures, put up, complete.
Two curtains for wireless house.
Two white oilcloths for 10-foot x 21-inch table.
Two white oilcloths for 8-foot x 21-inch table.
One silence cloth for cabin.
One silence cloth for officers' mess.
Two hassocks.
Four laundry bags.
Four folding yacht chairs.
Three waste-paper baskets.

63. Officers' Mess

Twelve knives and forks, silver plated.
Twelve tablespoons, silver plated.
Twelve teaspoons, silver plated.
One griddle.
Two large coffee boilers.
Two galley spoons.
Six mess kits.
One egg whip.
Six dessert spoons.
Two can openers.

One fish kettle.
Twelve 10-inch pie plates, enameled.

64. Firemen and Seamen

Eighteen iron-handle knives and forks.
Eighteen tablespoons, tin.
Eighteen enameled cups.
Six teaspoons, English nickel silver.
One French frying pan.
Two whisk brooms.
One tea strainer.
One coffee strainer.
One glass pepper shaker.
One glass salt shaker.
Two brass Yale locks.
One pair ice tongs.
Three hotel sauce pots and lids.
One coffeepot for cabin.
One teapot for cabin.
Three mess tins.
One gravy strainer.
Two hotel frying pans, egg.
Two muffin pans.
Two pots and lids, hotel soup.
Twelve 10-inch pie plates, enameled.
One Royal teapot.
One Royal coffeepot.
Six plain white vegetable dishes.
Six glasses.
Six 9-inch soup plates.
Six nickel-silver teaspoons.
One silver-plated butter knife.
Six large meat platters.
Two soup ladles.
Thirty-six glasses.
Two dustpans.
Two dust brushes.
One Royal teapot.
One Royal coffeepot.
One 17 quart Royal dishpan.
One alarm clock.
One spring balance.
Two wood stools.
Two large enameled coffee boilers.
Six 8-quart deep tin pudding pans.
Six cups and saucers, officer's mess.
Six dinner plates.
Six pudding plates.
One small funnel.
Three sirup jugs.
One ice-cream freezer.
One quart measure.
Two Boston bean pots.
One cake pan.
Two salt shakers.
Two pepper shakers.
Six nickel-plated soup dishes.
Two toothpick holders.
One set sadirons.
One biscuit cutter.
One doughnut cutter.
One dish basket.
Two bread boxes.
One cake box.
Three bread pans.
One double boiler.
Six coffee mugs.
Two paring knives.
Two bread knives.
One French knife.
One bread raiser, 17 quarts.
Two brown-bread moulds.
One sugar bowl.
Three butcher knives.
Two forks for galley.
One butter dish, hotel.
Eighteen enameled 7-inch pie plates for crew.
Eighteen enameled drinking cups.
Eighteen enameled soup plates.
Two butter dishes for crew.
One enameled soup tureen.
Twelve enameled pudding pans.
Four egg frying pans.
Two large frying pans.
One toasting wire.
One 7-quart double boiler.
Three tin cake pans.
Six hotel soup plates for mess room.
Twelve pie plates for mess room.
Two dozen hotel oatmeal dishes.
Two dozen hotel side dishes.
One colander.
Four soup stock pots.
Three brooms.
One lantern.
One mustard pot.
One vinegar cruet, engineers' mess.
Two vinegar cruets, sailors' and firemen.
Six enameled soap dishes.
Three hand scrub brushes.
One glass lemon squeezer.
Four 2-gallon tin milk cans.
Two No. 2 medium-brush cocoa mats.
Four small fry pans.
One hotel pan.
Two bread pans.
One cake turner.
Two meat forks.
Three biscuit cutters.
One flour dredge.
One refrigerator in pantry.

Furnishings

1. Miscellaneous

One template for bore of propeller hub.
One hundred and fifty bolts and nuts (assorted).
Two blocks (chain) for smoke-box doors.
Three buckets (water) with name of ship painted on.
One brush (hand).
Five brushes (tube).
One box of lamp wick, etc. (tin).
One set of eyebolts.
One rack for eyebolts.
One set ring bolts for cylinder covers.
One set eyebolts and shackles for cylinder covers.
Two eyebolts for piston rods.
One length of 1-inch rubber hose for cooling engine.
Two funnels.
One funnel with sieve.
One kettle (black).
Two lamps (engine room), brass.
Two lamps (gauge glass), brass.
Two lamps (stokehold), japanned.
One lamp (engineers).
Four lamps (flat).
Two lamps (paraffin, brass).
One ladder (wood).
One pair lamp scissors.
One piece lamp cotton.
One lever for stop-valve wheel.
Two mud rakes.
Eight oil cans.
One triplex block of suitable capacity for cylinder heads, and two half-ton differential chain blocks for engine room.
Two oil cans (pint).
One oil can (quart).
One oil bottle (gallon).
One oil measure (gallon).
One oil measure (half-gallon).
Three paint tins.
One salinometer and cooler.
One save-all for greaser.
One save-all (large).
One box split pins (assorted).
One syringe.
Two sticks solder.
One tallow tank.
One thermometer.
One 10 gallon lubricating oil tank (daily service).
One tank (paraffin oil), 40 gallons.
One ball copper wire.
One ball lead wire.
Six bars iron (assorted).

2. Tools

The following tools to be supplied to the engine:
One pair blocks and rope fall (two and three sheaves).
One pair blocks and rope fall (two and three sheaves, large).
One bottle jack.
One copper set.
Four calking tools.
Twelve chisels (cold) assorted.
Four chisels (smith's) assorted.
Twelve drills, assorted.
One ferrule machine.
Two ferrule tools.
Nine files.
One gage for crank shaft.
Six hammers (scaling).
One hammer (lead).
One hammer (quarter), 7 pounds.
Four hammers (hand).
One hammer (copper).
Two keys for set pins.
Two hammers (sledge) 14 and 28 pounds.
One key for each size of nut.
One rack for holding keys.
One key (crowfoot) for foot valves.
One key (crowfoot) for motion-bar combs.
Seven keys for polished glands.
One key (skeleton) for top and bottom ends.
One key (box) and wrench for steam-chest doors.
Two mandrels (tubes).
One pair pliers.
Six packing drawers.
Six packing sticks.
One ratchet brace.
One soldering tool.
Six tube scrapers.
One screw driver.
One shifting spanner (large).
One shifting spanner (small).
Four pair tongs.
One vise and bench.
One pair vise grips (copper).
Nine wedges.
One wrench and key for pistons.
One key for column nuts.
One brass eight-day engine-room clock, 8-inch dial.
One Tabor indicator, complete.
Two levers (indicator).
One set of stocks and dies with taps ¼ to 1½ inches, complete, with wrenches in box.
One grindstone with trough and handle.
One vise and bench for deck use.
Six tube stoppers for main boilers.
Tool board with brackets will be fitted in after end of engine room.
One set of No. 2 Armstrong pipe stock and 5 dies.
One set of No. 6 Armstrong pipe stock and 2 dies.
One set of No. 3 Armstrong pipe stock and 4 dies.
Three pipe-tap wrenches, Nos. 1, 2, and 3.
Ten pipe taps, sizes ¼ to 3 inches.
Two three-wheel pipe cutters, Nos. 2 and 3.
One hinged pipe vise, malleable iron.
One trimo chain wrench, flat chain.
One breast drill.
One portable ratchet forge.
One 150-pound anvil.
One set of straight-shank twist drills, from ⅛ to ½ inch by thirty-seconds.
One indexed case for the above drills.
One hack-saw frame, from stock.
Twelve blades for hack saw, from stock.
One pair tinsmith's shears, from stock.
One reamer for shaft coupling bolts.

3. Spare Gear, Main Engine

One eccentric strap, complete (go-ahead), with bolts and nuts.
One pair of top brasses for connecting rod.
One pair of bottom brasses for connecting rod.
Two top end bolts and nuts for connecting rod.
Three bottom end bolts and nuts for connecting rod.
Two main bearing bolts and nuts.
One valve stem.
Six follower bolts for each piston.
Two valves for attached feed pump.
Two valves for attached bilge pump.
One set of guard studs, valves, and seats for each steam pump.
Three cylinder relief valve springs.
One set springs, low-pressure piston.
Twelve studs for cylinder covers.
Six studs for valve-chest covers.
One tail shaft with continuous liners.
One set of coupling bolts for one coupling.
Twenty condenser tubes.
One hundred condenser-tube ferrules.

4. Boilers

One feed check valve for each main boiler.
One stop valve (main stop).
One blow-down valve.
One surfacing valve.
Fifty main boiler tubes.
Two safety-valve springs.
Six gage glasses.
One tube expander.
One furnace front pattern, complete.
Ten zinc plates for boilers.
Two feed check valve spindles.
Two feed stop valve spindles.
Four side Howden air valves, complete, with springs.
Two center Howden air valves, complete, with springs.

5. Fan Engine

One set crank-pin brasses.
One set crosshead brasses.
One valve stem.
One set valve-stem packing.
One set piston-rod packing.
One set main-bearing brasses for fan shaft.

6. Ice-Machine Engine

One crank-pin box.
One crosshead-pin box.
One crosshead pin.
Two piston rings.
One eccentric strap with rod and nuts.

7. Ice-Machine Compressor

One piston, complete, with suction valve.
One set piston rings.
One discharge valve, complete, with relief valve.
One set of shaft packing.
One split gland.
Eight bolts.
Sixteen small rubbers.
Sixteen large rubbers.
Four ammonia-return bands.
Four water-return bands.
Eight glands.
One ammonia inlet.
One water inlet.
Two ammonia pressure gages.
Assorted valve packing, lead and rubber washers.

8. Generating Sets

One piston rod.
One valve stem.
One set crank-pin brasses.
One set crosshead brasses.

(*Concluded on page* 412)

Marine News of the War

Interesting Sidelights on the World War Gathered During the Past Month and Condensed for the Busy Reader

WHILE the convoy system still furnishes the backbone of the antisubmarine campaign, gains have been made in other directions. Among these is the "dazzle" system, which is not to be confused with camouflage. The "dazzle" is an elaborate scheme of painting merchant ships all sorts of colors. The results have been excellent because of the precariousness of looking for enemies through a periscope. It not only confuses the view of perpendicular structures like funnels and masts, by which a submarine is able to identify ships and make out their courses, but creates doubt whether a merchantman may not be a destroyer or cruiser. Smokeboxes have a limited use for low visibility against surface attacks. The naval forces have been making a hard drive against the U-boats, and have been successful. Since July, 14 submarines are known to have been sunk, and four others are believed to have been destroyed. This is the greatest number ever sunk in the same period.

* * *

A Japanese diplomat acquainted with the character of the conversations which have been concluded between the Japanese mission and this government, points out that "it is not generally appreciated in America that Japan feels she is already doing her share in the war, and that she is furnishing her full quota of ships. One-third of Japan's total ocean-going tonnage is now in European waters. This amounts to 300,000 tons being devoted practically to war uses in European waters, and represents about all Japan can do. It is hardly seen by us how more ships could be supplied for war service. Japanese business concerns are suffering greatly from the scarcity of ships to transport commodities between the Americas and Japan. In spite of all this, we are using a third of our ocean-going tonnage in the service of the European trade with the entente countries. In this service we have lost three of our best and finest steamships, which were torpedoed and sunk by submarines near the British coast. Besides, we have lost a number of smaller vessels off the Spanish coast and near the French coast in the Mediterranean. All our largest ships except two are employed in the European trade, two being routed between Yokohama and San Francisco. In addition we are caring for the peace-time trade of England as best we can in the Indian ocean and in the Pacific, between India, Australia and Britain's other possessions, as well as China. It ought not to be forgotten, either, that Japan has been the carrier for Russia between the United States and Vladivostok. We have taken arms, ammunition and materials to Russia."

* * *

In an address before the war convention of American business men, called by the chamber of commerce of the United States, James A. Farrell, president of the United States Steel Corp., pointed out that "the war is a contest which will be decided by superiority in economic resources. At the beginning of the war both sides were in possession of these to a lavish degree. By dint of prodigal use by all the combatants, these resources have been very seriously reduced, and in the case of Germany they must be approaching exhaustion. There can be no question on which side lies the preponderance of economic strength. If it were merely a question of matching the resources of the entente allies with those possessed by the central powers, weight for weight, or bulk for bulk, the war would speedily come to an end. But the war is prolonged because of the skill and determination which Germany has brought to the organization and co-ordination of all the material forces available to her. It is here that an imperative obligation rests on American business to contribute its intelligence, its energy and its tenacity, whole-heartedly and unselfishly, to the problem of how all the resources at joint command can be best employed in war service.

"The United States is called upon to do its share of a tremendous task with a meager merchant marine. It is freely admitted that Great Britain at the outset of the war allowed a vast amount of merchant tonnage to be wasted through lack of centralized power, and it is doubly important that the United States should profit by the lesson by avoiding any such loss."

* * *

Reports from Washington indicate that the British government is still insisting on retaining ownership of the 1,025,000 tons of shipping for which it contracted in American yards before this country entered the war, and which has since been taken over, temporarily at least, by the United States shipping board in order to speed up construction. The final ownership of these vessels, which compose part of a fleet of 2,000,000 tons on the ways under British and other foreign contracts, is now the subject of diplomatic negotiation. The British view is that Great Britain has lost 4,000,000 tons gross by submarines since the war. Allowing for gains by new building and seizure of German ships, the net loss is 2,225,000 tons, while the American merchant marine, exclusive of 500,000 tons of German ships taken over, has gained nearly 1,125,000 tons.

* * *

Frank C. Munson, president of the Munson Steamship Line, has been designated by Chairman Edward N. Hurley to represent the shipping board on the exports administrative board.

Losses Sustained by British Shipping

Week ended:	Ships over 1600 tons	Under 1600 tons	Total
Mar. 4	14	9	23
Mar. 11	13	4	17
Mar. 18	16	8	24
Mar. 25	18	7	25
Apr. 1	18	13	31
Apr. 8	17	2	19
Apr. 15	19	9	28
Apr. 22	40	15	55
Apr. 29	38	13	51
May 6	24	22	46
May 13	18	5	23
May 20	18	9	27
May 27	18	1	19
June 3	15	3	18
June 10	22	10	32
June 17	27	5	32
June 24	21	7	28
July 1	15	5	20
July 8	14	3	17
July 15	14	4	18
July 22	21	3	24
July 29	18	3	21
Aug. 5	21	2	23
Aug. 12	14	2	16
Aug. 19	15	3	18
Aug. 26	18	5	28
Sep. 2	20	3	23
Sep. 9	12	6	18
Sep. 16	8	20	28
Sep. 23	13	2	15
Sep. 30	11	2	13
Oct. 7	14	2	16
Total	584	207	791
Weekly average for first 3 months			29.8
Weekly aver. for second 3 months			28.8

Photographs From Far and Near

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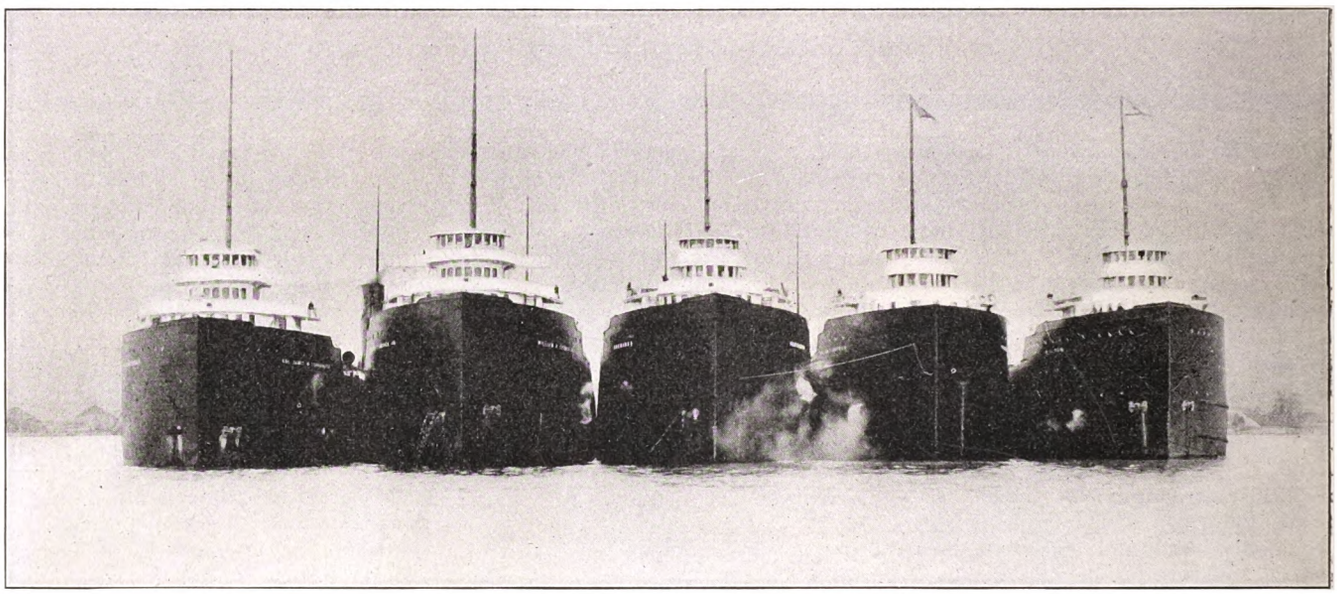


GREAT LAKES FLEET OF THE SHENANGO FURNACE CO. TRIP CAPACITY 58,200

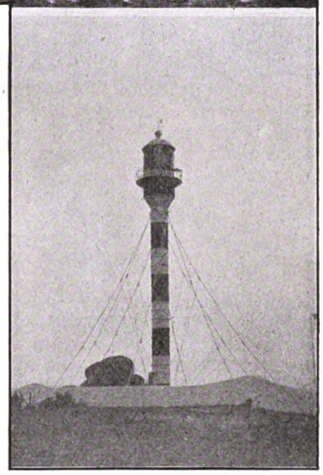
SAILORS ENJOYING "THE WATCH BELOW" ON A GREAT LAKES FREIGHTER

A HARD TEAM TO BEAT—AMERICAN BATTLESHIP AND DESTROYER

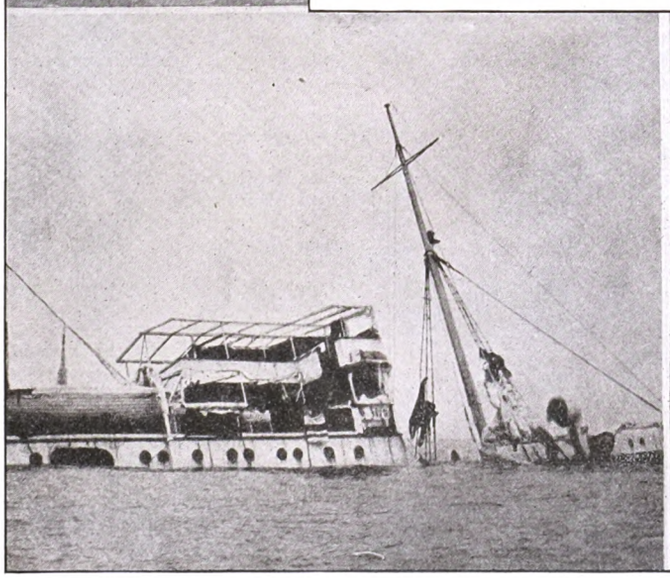
BIG NEW FRENCH PASSENGER STEAMER LUTETIA READY TO LAUNCH

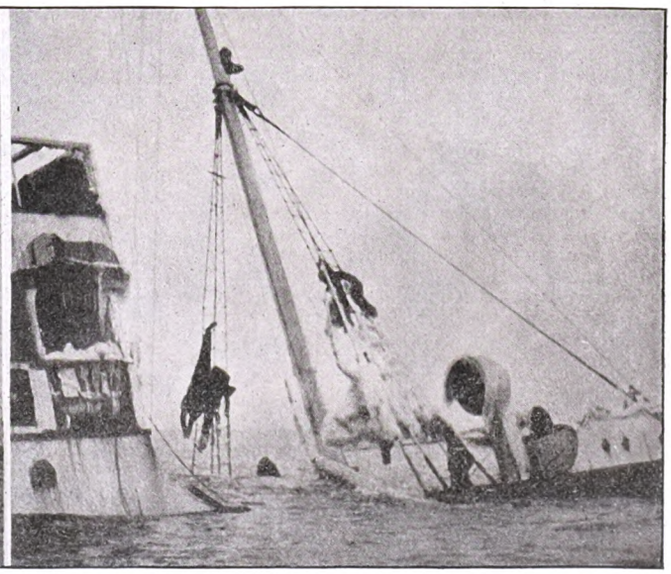
Latest Marine News in Pictures

Payment Will Be Made For Acceptable Photographs



HARDY MARINERS MUST STILL RECKON WITH PERILS OF THE SEA WHICH ARE NOT OF GERMAN ORIGIN, AS THE ILLUSTRATIONS ON THIS PAGE REVEAL. THE ACCOMPANYING VIEWS HAVE JUST BEEN FORWARDED TO THE MARINE REVIEW BY A CHINESE SUBSCRIBER. THE WRECKED BOAT IS THE JAPANESE STEAMER HANKAKU MARU, WHICH WITH MORE THAN 250 PASSENGERS, MISSED THE ENTRANCE AT CHEFOO HARBOR, YELLOW SEA, AND WENT ON THE ROCKS. THE VESSEL STRUCK DURING A HEAVY SNOW STORM AND FOR MORE THAN THREE DAYS NO RESCUE WAS POSSIBLE, ALTHOUGH THE BOAT WAS ONLY ¼ MILE FROM SHORE. THE PASSENGERS WERE CROWDED ON THE BRIDGE IN ZERO WEATHER WITH NO FOOD AVAILABLE AND THE SEAS CONSTANTLY BREAKING OVER THE WRECK. ON THE THIRD DAY A LIGHTER WAS DRIFTED DOWN TO THE SHIP AND THE 70 SURVIVORS RESCUED. THREE WERE JAPANESE WOMEN, TWO WERE RUSSIANS AND THE REST CHINESE AND JAPANESE SAILORS. THE VIEWS SHOW THE SHIP AS SHE RESTED ON THE ROCKS AND ALSO SOME OF THE BODIES FROZEN SOLIDLY TO THE RIGGING. THE SMALL VIEWS SHOW SOME OF THE EXCELLENT LIGHT STATIONS MAINTAINED BY THE CHINESE MARITIME CUSTOMS. GENERALLY THEY ARE UNDER THE CHARGE OF FROM ONE TO THREE FOREIGN LIGHTKEEPERS. THEIR EQUIPMENT IS EXCELLENT AND MEASURES UP FULLY TO OCCIDENTAL STANDARDS.





Late Decisions in Maritime Law

Legal Tips For Ship Owners and Officers

Specially Compiled for The Marine Review

By Harry Bowne Skillman

Attorney at Law

ALTHOUGH an owner of a vessel is not in any legal sense the employer of a longshoreman in the employ of a master stevedore, he must exercise ordinary care in providing reasonably safe and suitable equipment, hatch covers or planks, for the use of those who are hired to load or unload the vessel and to cover or uncover the hatches. "If by the exercise of diligence or carefulness," said the court in the case of COLON, 241 *Federal Reporter* 592, "claimant might have known that the planking for the hatch cover was insufficient in length, or had become worn at the edges from use so that it did not fit snugly on the shoulder or recess of the strongback, as asserted, there was a failure of duty to libelant, who sustained injuries by reason thereof, and recovery may be had in an action *in rem.*"

* * *

The custom of stowing cargo in a particular part of the vessel, according to the case of SAN GUGLIELMO, 241 *Federal Reporter* 969, never can be justification for stowing more of a cargo than all of the conditions in their relation to physical surroundings and location will justify.

* * *

Prepaid freight, in the absence of an agreement to the contrary, decides the case of the National Steam Navigation Co., Ltd., of Greece, vs. International Paper Co., 241 *Federal Reporter* 861, must be returned to the shipper, if the goods do not arrive, and in such case the shipowner cannot recover it of the shipper, if not actually prepaid.

* * *

One who furnishes repairs on a charterer's order is not entitled to a lien, where he knew of the charter, and by reasonable diligence could have learned of a provision therein under which the charterer had no authority to bind the vessel, though it acted in good faith and believed that the vessel was liable.—SYLVAN GLEN, 241 *Federal Reporter,* 731.

* * *

The court, in deciding the case of KAUPANGER, 241 *Federal Reporter* 702, said: "It is the ship's duty to load. It is even her duty to pay for the cost of ballast." Then further: "Yet this duty depends only upon the presumption from the original custom, when the ship's crew stowed and discharged; it may, of course, devolve upon the charterer by his assuming it, either before or after the charter party itself."

* * *

The federal statute which requires seamen to be signed before a shipping commissioner and provides that shipment of seamen in violation of any act of congress shall be void applies only to American vessels, and, according to the case of ELSWICK TOWER, 241 *Federal Reporter* 706, signing of foreign seamen in a United States port before a British consul for service on a British vessel creates a valid contract. This case further decided that refusal of such seamen to work further after arrival of the vessel in a port of the United States was an act of desertion, where their contract of service had not expired, and they forfeited their right to wages.

* * *

The California workmen's compensation act was involved in the case of Riegel vs. Higgins, 241 *Federal Reporter* 718, and it was there held that such act cannot and does not deprive an injured seaman of his right of action in an admiralty court for damages for injuries caused by the negligence of a shipowner in providing defective appliances. However, it was decided if the injured seaman shall submit himself to the state tribunals, and claim and receive the amount awarded under the act, or if by agreement, fairly entered into, the amount to be paid under the act is fixed, and he accepts it with full knowledge of the extent of his injuries, he should not later be permitted to maintain an action for the same injuries.

* * *

The rule entitling a seaman to maintenance and care at the expense of the vessel or owner if he falls sick or is wounded in the service of the ship applies where the misfortune attacks him while he is attached to the ship as part of her crew. It is not necessary, according to the case of BOUKER, No. 2, 241 *Federal Reporter* 831, that the wound or illness should be directly caused by some proven act of labor; it is enough that he was, when incapacitated, subject to the call of duty as a seaman, and earning wages as such. It was held that an engineer, even on a harbor tug boat, is a seaman, within the meaning of the rule, and that the liability may extend for a reasonable time beyond the seaman's term of service, when necessary to effect a cure.

* * *

A tug or other vessel acting as such is not a common carrier, according to the case of the ATLANTIC CITY, 241 *Federal Reporter* 62.

* * *

A provision of a charter party that any dispute thereunder shall be submitted to arbitration does not deprive the parties of the right to appeal to the courts, it was held in the EROS, 241 *Federal Reporter* 186.

* * *

A charterer who, without disclosing that it was acting for anyone else, applies for wharfage, agrees upon a charge, and sends the vessel to the wharf, is responsible, even though the liability between it and the owners was primarily on the latter, it was decided in American Warehouse & Trading Co. vs. Davison Lumber Co., 240 *Federal Reporter* 126.

* * *

Revised Statutes of the United States, section 4452, give a right of appeal from the decision of a board of local inspectors of steamboats refusing to grant a license, or suspending or revoking a license, to any person deeming himself wronged by such refusal, suspension or revocation. The case of Joyce vs. Bulger, 240 *Federal Reporter* 817, holds that the right of appeal is given only to an interested party and that a stranger to the proceeding has no standing.

* * *

The charter of a dumping scow including a man to take care of her, but without motive power of her own, for an indefinite time at a certain charge per day, is, according to Hastorf vs. F. R. Long—W. G. Broadhurst Co., 239 *Federal Reporter* 852, regarded as a demise, the charterer becoming the owner *pro hac vice.* A time charter of a tug, by which the charterer acquired exclusive possession, control, etc., was likewise decided, in the case of Johnson Lighterage Co., No. 24, 240 *Federal Reporter* 435, to be a demise.

* * *

The rights of navigation and of improving navigability were paramount to the rights of a gas company, which laid its pipes in the bottom of the Harlem river, it was declared in the decision in a proceeding brought to limit liability, reported in 241 *Federal Reporter* 69, and a dredge employed in improving the navigability of the river was not liable for an injury to the company's pipes unless there was negligence. It was held in the same case that a shipowner may limit liability for a tort, though it is nonmaritime and cannot be sued for in admiralty.

* * *

If a tow collide with some vessel on the voyage, or with any object subject to admiralty jurisdiction, other than a vessel, such, for instance as a beacon or channel light, it is not liable in the absence of negligence—The C. W. MILLS, 241 *Federal Reporter* 204. It was decided further in this case that the care required of a tug with tow is only ordinary care. But ordinary care required of those engaged in the profession of towing is a high degree of care, for they hold themselves out as experts. "The measure of care required," it was said, "is similar to that required of pilots. They are, in fact, pilots." It is the duty of the tug to see that the tow is properly made up, and that the lines are sufficient and securely fastened, whether she furnishes the lines to the tow, or the tow to her.

In the Traffic Manager's Office

A Review of the Month on Coasts and Lakes—Useful Pointers for the Men Who Get the Business

Ships Bring Record Prices on Pacific

NOTWITHSTANDING the general uncertainty in business circles, and the doubts aroused by shipping board regulations and by intimations of other governmental action, more sales of shipping in north Pacific centers have been recorded since the first of the present year than in any previous period of similar length. In the same time the price of tonnage, both that in operation and under construction, has advanced in much greater degree than in the two and one-half years preceding, or from the beginning of the war to Jan. 1, 1917.

Vessels purchased less than 12 months ago at what were thought to be prohibitive prices are worth today from 50 to 100 per cent more. When values will reach the zenith no one will venture to predict. The action of the government in fixing charter rates will without question affect the price of some tonnage but whether it will weaken the value of sailing vessels and steamers of less than 2500 tons is a question for the future to decide

Last November, Norwegian interests purchased four wooden auxiliary schooners then building in Seattle for $260,000 apiece. These ships are of 2600 deadweight tons each, equipped with twin internal-combustion engines. They are four-mast schooners, of modern type and well constructed. The price was then the record and the Norwegian purchasers were believed to be taking a long chance in acquiring tonnage at such a figure. Today vessels of the same type are firmly held at $400,000 each.

One of the most spectacular deals in sail tonnage involves the iron, four-mast bark AUSTRALIA, built in England in 1886 and operated later under the German and Chilean flags. This vessel of 2115 net tons, was purchased in the spring of 1916 by a lumber exporting firm for $70,000, as it was deemed cheaper to purchase the vessel than to pay the going freights. In May, 1917, this vessel, since renamed PHYLLIS, was sold to the New York Star line for $275,000. The Chilean (formerly British) full rigged, four-mast ship COUNTY OF LINLITHGOW was purchased by the same Pacific firm at the same time for approximately the same price and has since been resold under the name of KATHERINE to Spanish buyers. This vessel is of iron, 2205 net tons, and was built in England in 1887.

Although the figures are not available, considerable interest attaches to the steamship LIEUTENANT DEMISSIESSEY, built at the Skinner & Eddy yards, Seattle. This vessel is of the standard 8800-ton type. She was ordered by Mitsui & Co., on their own account and, prior to launching in August, was purchased by the French. Although some well authenticated reports state that the vessel brought $3,000,000, it is more reasonable to assume that she changed hands for about $2,500,000 and at that returned her first owners a sufficient profit to pay for a large portion of another steamer of similar type ordered by the big Japanese firm.

Of new tonnage recently sold, the wooden steamer ROSEWOOD, built at Bellingham, Wash., for owner's account, carrying capacity about 2700 tons, was taken at a figure said to be $150 per deadweight ton. The auxiliary schooner MAY, built at Astoria, Oreg., brought $130 per deadweight ton, or $300,000, but it is not likely that vessels o fthis type could be obtained today at this figure, $150 per ton being about the figure asked now. The five-mast wooden schooner SEABORN, equipped with auxiliary steam engines, is said to have been sold at $170 per ton, the higher figure being due to the preference given steam over oil engines. The SEABORN carries 2100 tons.

The old steamer ZAEIRO, which figured as a collier with Dewey at Manila in 1898, is being rehabilitated and her recent sale therefore commands considerable interest. Ten years ago this vessel was sold by the navy for junk, and the engines removed and the hull dismantled. For several years she has lain neglected at Vancouver, B. C. Now she is being rebuilt as the BOWLER, with wood and composite and will have Atlas semidiesel engines installed. The vessel's deadweight will be 2000 tons and she brought $130 per ton.

The British steamer TURRET CROWN, purchased on the Great Lakes by James Griffiths & Sons less than two years ago, has just been sold to French interests. This vessel is a whaleback of about 3100 deadweight tons, 253 feet in length, registering 1142 tons net. She was built in England in 1895. While the price paid for this vessel was not made public, there is reason to believe that she brought between $450,000 and $500,000, which is supposed to be about twice her cost two years back.

There has been an active demand for tugs on the west coast, particularly for seagoing craft. The big tugs SAMSON and HENRY J. BIDDLE have been sold at prices not made public. The TATOOSH, a wooden tug, 119 feet long, 154 tons net and built in 1900 is said to have brought close to $300,000. This vessel has a steaming radius of 14 days. The steel tug KINGFISHER, 130 feet long, 141 tons net and built in 1902, is now enroute to the Atlantic for delivery to new owners. She was sold by James Griffiths & Sons for a price said to be about $125,000. The wooden tug ARCTIC, since commandeered by the government, was sold for about $75,000. This vessel is of wood, was built in 1913, is 111 feet in length and registers 69 net tons. The GOLIAH, one of the best steel ocean-going tugs on the Pacific coast, is said to be held at $357,000.

Probably the record price paid for old sail tonnage on the west coast was realized for the four-mast, wooden barkentine AMAZON, said to have been sold to Mobile owners for $160,000.

The AMAZON registers 1105 tons net, is 209 feet in length, was built in 1902 and carries 1,400,000 feet of lumber. This price seems entirely out of proportion but it is understood the new owners had several charters which assured them a return of their investment within a short time. Gulf of Mexico buyers have acquired the schooner STIMSON, 17 years old, with a lumber capacity of 1,000,000 feet, for about $75,000 and the schooner SEHOME, 621 tons net, built in 1899 and carrying 850,000 feet, for $50,000. Barkentine BENECIA, 18 years old, 653 tons net and carrying 850,000 feet, changed hands for $57,500. Schooner CHURCHILL, 17 years of age, 600 tons

net, lumber capacity 900,000 feet, was bought by Australian interests for $62,500. The same purchasers also took the schooner WILLIAM H. SMITH, built in 1899 and carrying 750,000 feet, for $70,000, as well as the five-mast schooner GEORGE E. BILLINGS, built in 1903, and having a capacity for 1,500,000 feet.

Illustrating the prices paid for other classes of tonnage, the little local steamer ISLANDER, 72 feet in length, 87 tons net, built in 1904, was sold for $28,000, after being remodeled for service in the Mexican coastwise trade. The dismantled hulk WILLIAM H. SMITH, built at Bath, Me., in 1883, and registering 1785 tons net, was sold several months ago for about $75,000 for use as a coal carrier coastwise. The steel steamer NORTHLAND, built in Seattle 10 years ago at a cost of about $73,000, is now on the market in a damaged condition. This vessel was in deep water in an Alaskan harbor for more than a year and was recently salved. Her present owners recently rejected all bids because none of them approximated $100,000, the figure at which she is now valued. To place her in operating condition will cost about $40,000. Her deadweight capacity is about 750 tons.

The owners of the iron, six-mast barkentine E. R. STERLING, which has a deadweight capacity of about 4200 tons, are said to have received an offer of $350,000 for the ship but it has not yet been accepted. This vessel is one of the two six-mast barkentines afloat. She was built at Belfast in 1883 as the bark LORD WOLSELEY, later carried the German flag as the COLUMBIA and, after being wrecked on the Pacific coast, was rehabilitated as the British barkentine EVERETT G. GRIGGS. She is now under the American flag.

Since a year ago many owners of wooden, lumber-carrying sailing vessels have sold their vessels at handsome profits, taking the position that it was good policy to do so, inasmuch as their ships had passed well beyond the first classification period and that it was better to sell at high figures than attempt to operate for the few years remaining for vessels of their age. In some cases, owners have placed orders for new tonnage and were willing to sell their older vessels. However, the era of high freights has brought from retirement hulls and hulks of every description, long since relegated to the scrap heap. Vessels, which for years had been operated either at a loss or had barely broke even, have been sold at prices in excess of their original cost. The submarine campaign has brought wealth to many Pacific owners who had lost all hope of ever breaking even on their investments in floating property.

Improve New York Harbor

Commission Will Attack Problem of Modernizing Facilities of Country's Greatest Port

By Edward F. Cullen
President, Cullen Barge Corp.

GREATER New York harbor may now look for relief from freight congestion. Old-fashioned methods of handling freight for overseas will now be relegated to the rear and new and modern facilities will prevail. Governor Whitman, of New York, and Governor Edge, of New Jersey, have appointed the men to serve on the New York-New Jersey harbor development commission.

There is a great need for more barges and lighters for the transference and storage of freight in New York harbor. As a temporary storage place, the average freight barge is hard to compete with as the water in which it rests costs only a nominal fee, which is exacted by the state for wharfage.

Efforts to alleviate the freight car shortage and congestion were begun on July 7, 1917, with the formation of the interstate commerce commission's division to regulate freight car service in delivering freight to our seaports until we can increase our port facilities. There was appointed at the head of this division a traffic expert who was formerly connected with one of the most successful terminal companies in this country. He said recently that the true solution for the present needs of the port of New York were more well appointed warehouses and more modern barges for use in the harbor, sound and river. Our local and United States officials are bending every energy to prepare our piers, docks and marginal railways for the receipt and dispatch of the greatly increasing volume of freight arriving in the port of New York.

Many barge canal terminals are being constructed here and will be equipped with the latest devices known for the quick and inexpensive handling of freight of all kinds. These terminals will be harnessed with fast-acting cranes, capable of moving a load of many tons, conveying machinery that will carry a constant chain of small freight or, at the new coal piers, deliver coal to the barges for final transfer to ships in the shortest possible time that human ingenuity and skill can contrive.

To facilitate further the moving of the harbor's enormous quantities of freight and to unload more speedily freight from freight cars, promoters are busy with a plan to connect up New York's entire waterfront into one gigantic municipal terminal railway. Special freight yards are being designed for the receipt of each class of freight. Coal would, on its arrival here, go immediately to the coal yard, steel to the steel yard, L. C. L. freight to the L. C. L. freight yard, lumber to the lumber yard, etc. These terminal yards are to be equipped with the latest known inventions to load speedily on barges each class of freight with a minimum amount of man power.

The French government has purchased the steamship RACINE, which was brought to the coast from the lakes last summer for J. W. Elwell & Co., New York. Alterations costing $100,000 will be made at Boston.

Specifications for U. S. Steel Ship

(*Concluded from page* 406)

One set of brushes.
One complete set of bearing boxes.

9. Circulating Pump and Engine

One valve stem.
One set crank-pin brasses.
One set crosshead-pin brasses.
One set piston rings.
One eccentric strap, complete, with bolts and nuts.
One complete set bearing boxes.

10. Winches

Item	Number required for 8¼ x 10, single geared	8¼ x 10, compound geared	6¼ x 8, single pound geared
Pistons and rods	2	1	1
Valve stems	2	1	1
Eccentric straps, complete	2	1	1
Crank-pin boxes	2	1	1
Crosshead pins and boxes	2	1	1
Piston rings	2	1	1

11. Windlass

One piston and rod.
One valve stem.
One set crank-pin boxes.
One crosshead pin and bushing.
One eccentric strap, complete, with bolts and nuts.
One set piston rings.

12. Steam Gypsy

One valve stem.
One piston and piston rod.
One set piston rings.
One crank-pin box.
One crosshead pin.

13. Steering Engine

One piston and rod.
One set piston rings.
One valve stem.
One eccentric strap, complete, with bolts and nuts.
Two crank-pin boxes.
One crosshead pin and bushing.

American Ship Yard Activities

A Snappy Summary of the Leading Events of the Month in the Vessel Construction Field

South's Largest Wooden Passenger Ship

THE wooden steamer MAPLE, the largest passenger and freight-carrying ship ever built in the south, was launched on Sept. 15 at the yards of the Slidell Shipbuilding Co., Slidell, La. She is 190 feet long and 34 feet beam, and has a cargo depth amidships of 11 feet 6 inches, and an outside depth of 13 feet 4 inches with beam overall of 38.8 feet. She has stateroom accommodations for 20 passengers. The MAPLE will be placed in the passenger service between Miami and Jacksonville, Fla., by the Coast Steamship Co., of which Charles L. Dimon, Mt. Vernon, N. Y., is president. She will have a speed of 10 knots and will be propelled by an 800-horsepower engine.

Southern pine is used almost exclusively in the ship. Moving pictures of the launching were taken under the auspices of the Southern Pine association, to be shown throughout the country as an educational feature. Mills connected with the association furnished most of the lumber used in the construction of the ship.

The MAPLE was the third wooden steamship to be launched at the Slidell yards. Two other wooden hulls are now on the ways, one of which is expected to be launched in 30 days and the other in four months. The Slidell plant, which will shortly be one of the largest in the south, was for a number of years operated as the Slidell Drydock & Shipbuilding Co., engaged in the work of building barges and small vessels. The yard is now being expanded to build large composite ships.

Labor Conditions in Far West

In view of recent labor disturbances in Pacific coast shipyards, the following facts may be of interest:

In most western wooden shipyards the men are paid on a straight, day-wage basis. No attempt has been made up-to-date to standardize operations or to introduce premium or piece rates. Most yard managers have found difficulty in preventing the men from drifting from one plant to another and in one case an effort has been made to overcome this tendency by offering a dividend of 7 per cent of their annual wages to all men who remain on the job continuously for a year. This same yard offers a two weeks' vacation also at the end of the year to men who have been steadily on the job, and have earned their dividend.

On Puget sound practically all of the yards work eight hours a day and the wages in June were as follows:

	Per day
Shipcarpenters and joiners	$5.50
Hammer men and borers	3.50
Ship laborers and helpers	3.00
Yard laborers and helpers	2.75

In one of the most prominent yards on the Columbia river, at Portland, the wages are as follows, some of the men working eight hours and others nine hours per day:

EIGHT HOUR GROUP

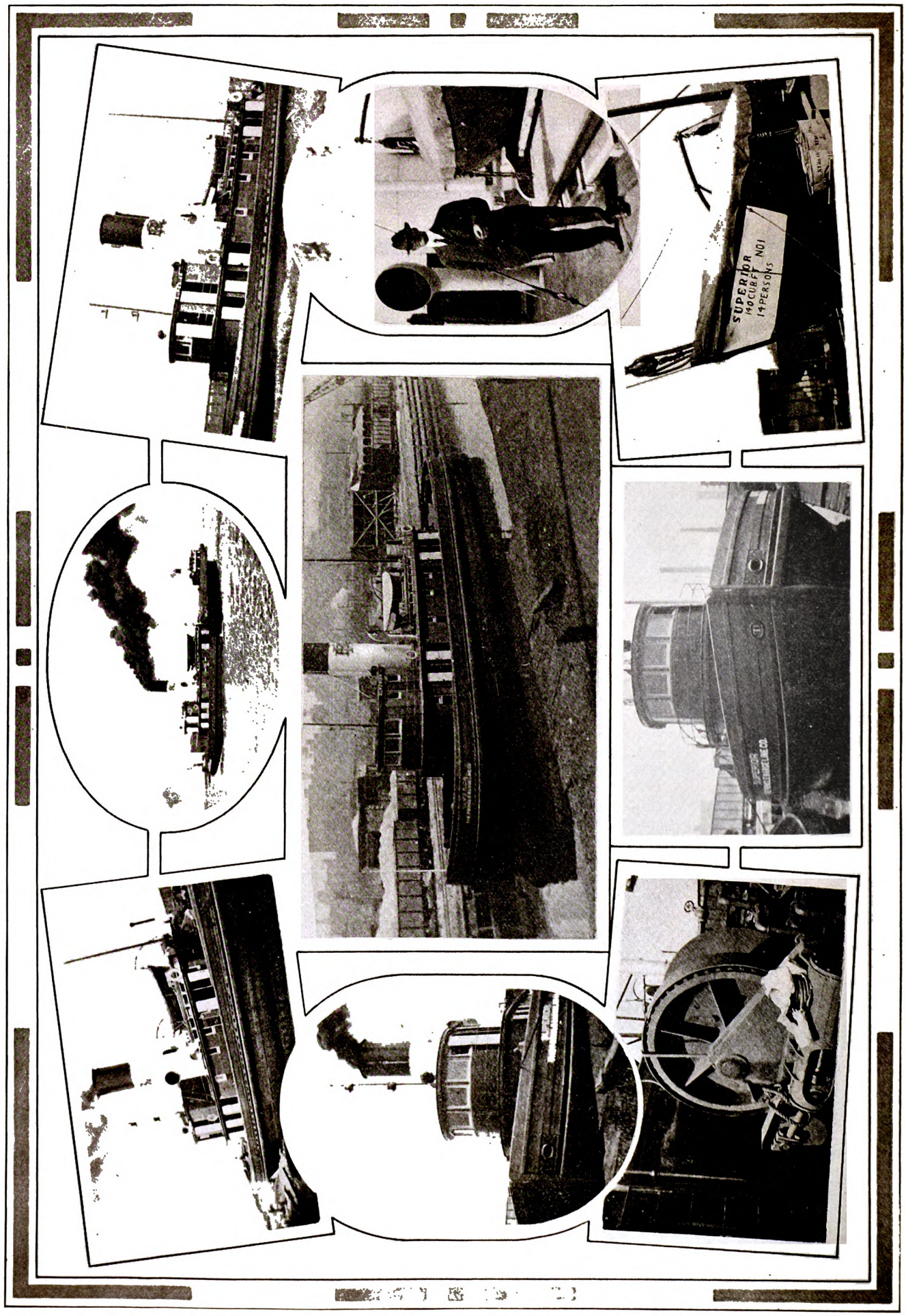
	Per day
Planking gang	$3.00
Hammer gang	3.00
Boring machine men	3.50
Ship carpenters	5.00
Plain carpenters	4.00

NINE HOUR GROUP

All helpers	$3.00
All apprentices	2.25

The ship building industries on the Pacific coast, both steel and wood, are pretty thoroughly unionized and in only a few cases are open shops conducted. International Workers of the World are quite active and in some cases their

LAUNCHING LARGEST PASSENGER AND FREIGHT CARRYING SHIP EVER BUILT IN THE SOUTH



PASSENGER STEAMER SUPERIOR REBUILT AS LAKE TUG. CAPT. W. R. PRINGLE IS SHOWN AT THE RIGHT

representatives have been permitted to distribute literature right outside the yard gates. This may have some influence on the present situation.

The labor supply is only fair; skilled ship carpenters are unusually scarce. There is a larger percentage of English speaking labor than in the east. Most yard managers estimate that at least 25 per cent of their men actually engaged in ship construction should be skilled. A higher proportion of skilled men at this time would be highly desirable.

New Shipbuilding Center

Mobile, Ala., yards have contracts from the shipping board for 26 ships. The Tennessee Coal, Iron & Railroad Co., a subsidiary of the United States Steel Corp., is planning to build an immense yard in that city. Coupled with the activities of other companies, these facts combine to give Mobile an assured and prominent position in southern shipbuilding activities for years to come.

The contracts for the 26 merchant ships already in the hands of Mobile shipyards will mean an expenditure of $13,000,000, exclusive of labor, each vessel to cost a half million dollars each. The labor on each vessel will represent an expenditure of between $150,000 and $200,000.

Contracts for vessels announced up to date include 18 to be built by the Kelly-Atkinson Co., four by the Murnan Shipbuilding Corp., and four to be constructed by the Alabama Dry Dock & Shipbuilding Co.

World's Available Tonnage

A chart prepared by the shipping board which, it was stated, represented the gross tonnage of the world (enemy countries not included) available for transatlantic trade in the first week in September, placed the liners owned by Great Britain at 4,860,000 gross tons and the tramp steamers at 8,540,000 gross tons. The United States was credited with approximately 2,000,000 gross tons. The table follows:

WORLD'S AVAILABLE TONNAGE

	Atlantic	Pacific
United Kingdom:		
Liners	4,860,000	650,000
Tramps	8,540,000	450,000
Norwegian	1,800,000	50,000
Sweden	860,000	.....
Denmark	690,000	.....
Holland	1,200,000	275,000
United States	2,000,000	400,000
French	1,600,000	220,000
Italian	1,250,000	70,000
Greek	47,000	.....
Spain	750,000	.....
Portugal	150,000	50,000
Russia	350,000	200,000
Belgium	280,000	.....
South America	600,000	200,000
China	.....	35,000
Japanese	100,000	1,900,000
Total	25,500,000	5,500,000

Vessels on inland waterways and in the Baltic are estimated at 6,000,000 tons gross; coastwise shipping at 6,000,000 tons, and enemy shipping at approximately 5,000,000 tons. These are not accounted for in the table.

Passenger Boat Rebuilt as Lake Tug

A FORMER passenger steamer which had later served as the only supply boat on the Great Lakes, went into commission a few days ago as a tug. The vessel is the SUPERIOR, which is now in the service of the Pringle Barge Line Co., Cleveland. She was remodeled into one of the largest tugs ever on the lakes and is one of the big tugs now in commission on fresh water.

The SUPERIOR was built in Cleveland in 1890 as a passenger steamer to operate on a ferry service between Duluth and Superior, Wis. Together with a sister ship, the DULUTH, she was designed for all-year service and for that reason was particularly modeled for ice crushing, as shown in the illustration presented on the facing page. The two boats operated successfully on this route until the construction of a bridge between the two ports at the head of the lakes enabled the street car company to give continuous service between these two cities.

The SUPERIOR was then used for some time as an excursion boat out of Chicago. For some years she was used on various routes and for excursion runs between Cleveland and Euclid Beach, until acquired by the Pittsburgh Steamship Co. and fitted up as a complete supply store to supply all the Pittsburg company's boats passing through the Soo river. This was the first time that a supply boat had been used by any of the lake steamship companies and the SUPERIOR proved highly successful. As the company's business increased, it became necessary to operate a larger supply boat and the SUPERIOR was sold to the Pringle Barge Line Co. in the spring of this year.

The former passenger boat was taken to the Wolverine drydocks at Port Huron, Mich., where she was completely rebuilt under the direction of Walter R. Pringle, her present master, and E. S. Cleveland, chief engineer.

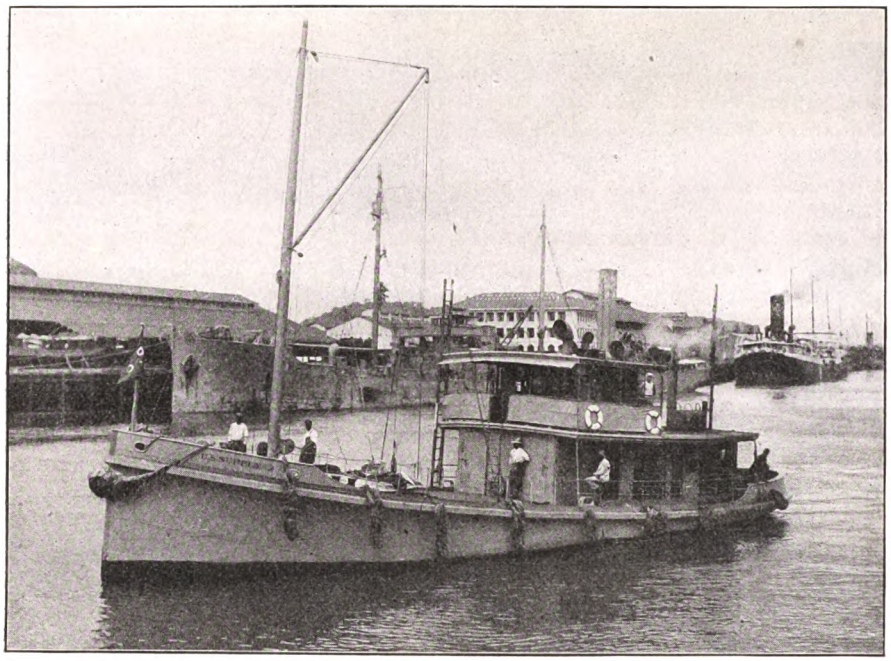
Her present dimensions are 98 feet between perpendiculars, 29 feet 6 inches wide and 10 feet molded depth. The alterations were carried out with unusual thoroughness, the lower hull being practically all that is left of the original boat. She is fitted throughout with exceptionally heavy timbers and her deck beams are reinforced with steel trusses. A new 7-kilowatt electric plant was installed. She was fitted with a searchlight, steam steering gear, automatic towing machines with wire cable, and with the other apparatus necessary to fit her for towing and emergency service. A center hatch was provided to facilitate coaling. She now has capacity for carrying 125 tons of coal. Her Providence towing machine carries 1500 feet of 1⅜ wire cable. The boiler is 15 feet long and 114 inches in diameter, carrying steam at 110 pounds pressure. Her engine has cylinders 20 x 30 inches by 2-foot stroke.

The SUPERIOR will be used principally in towing the barges of the Pringle company in the coal trade. Owing to her size and equipment, however, she probably will be employed at times for wrecking purposes. The accompanying views were taken at the dock in Cleveland where the SUPERIOR was built 27 years ago and where she was fitted out before beginning her new career as a tug.

Panama Supply Boat

The two diesel-engined boats built on the isthmus of Panama for the Panama canal, and which are shown in the accompanying illustrations, were designed primarily to carry supplies to ships in the harbors, and are designated as supply boats. The cargo hold of each boat has a capacity of about 20 tons, and rigging on the forward deck handles goods in loading and unloading.

The dimensions of the boats are as follows: Length over all, 85 feet; length at water line, 75 feet; beam, molded, 20 feet, depth, molded, 9 feet; designed draft 5 feet 6 inches; displacement, 140 tons. The forepeak is used as a fuel-oil tank, with a capacity of 6 tons of heavy oil. The engines consume less than a gallon of fuel per mile, and the boats have a cruising radius of about 2000 miles. Abaft the forepeak is the chain locker and hatch to storerooms, port and starboard; these storerooms are available for storing small articles such as tobacco, cigars, soap, men's outfits, miscellaneous supplies, etc. The cargo hold has a capacity of about 20 tons and will store provisions in crates to be sold to vessels. A fresh water tank of 50 tons capacity, built be-



DIESEL-ENGINED SUPPLY BOAT AT PANAMA

tween the machinery space and the cargo hold, will supply fresh water to vessels. In addition to this main tank, the afterpeak is arranged as a water tank with a capacity of 20 tons, and is piped so the two tanks can discharge water to each other or to vessels alongside.

The power plant for these boats consists of a 4-cylinder, 4-cycle, diesel engine of 120 brake horsepower, operating at 350 revolutions, built by the New London Ship & Engine Co. It drives a propeller 52 inches in diameter by 30-inch pitch. This engine is started by air, under a pressure of 900 pounds, and burns a low grade of fuel oil. The auxiliary outfit consists of a 24-horsepower, 4-cycle Palmer engine, operated by gasoline, connected by clutches and belts to an air compressor, 3-kilowatt dynamo, a centrifugal pump and bilge pump, all attached to one bedplate.

Accommodations for the crew are provided in the main deck house and consist of galley, mess room, chief engineer's stateroom and quarters for five "silver men", with toilet and shower spaces for officers and crew. At the forward end of this house is a cold-storage compartment, insulated with cork. It is capable of stowing 21 blocks of ice and nine quarters of beef, and in addition such perishable articles as are usually kept in cold storage. Cargo grating is fitted over the steel deck forward of the house to provide storage for 20 tons of provisions, in addition to the 20-ton capacity of the hold.

A small house on the bridge deck provides staterooms for captain and commissary clerk, forward of which are the steering wheel, binnacle, etc. A mast, boom and rigging with a simple hand winch are arranged to lift a load of 1200 pounds 35 feet above the water. This height is necessary to land cargo on the decks of vessels, and also to stow cargo aboard the supply boat when alongside the wharf at Balboa at low tide, where there is a difference of about 18 feet between high and low water.

The doors and window sash throughout are of teak; the boat is well ventilated and lighted and, considering its dimensions, embodies characteristics not often seen in vessels of its size. These vessels are proving very useful in the work for which they were designed. They are being used as light towboats in addition to their other duties.

The crew of each boat consists of master, engineer, cook and six deckhands. One of the deckhands serves also as an assistant to the engineer, wiping, oiling, etc. Two deckhands are sufficient for the ordinary needs of the boat, but four extra are carried for work in handling the supplies for ships. The master is paid $125 a month, the engineer $100; both are white men. The others, all negroes, are paid an average of about $37.50 a month. All receive subsistence, for which an allowance of $150 per month is made to feed the nine men. The total crew cost is approximately $627.50 per month.

The boats have been in operation such a short time that operating costs determined from performances to date are not conclusive. During the month of August the main engine of boat No. 2 used:

17 barrels of Diesel oil, at $3	$51.00
30 gallons Monogram oil, at 53c	15.90
3 gallons compressor oil, at 22c	.66
5 gallons kerosene, at 13c	.65
Total	$68.21

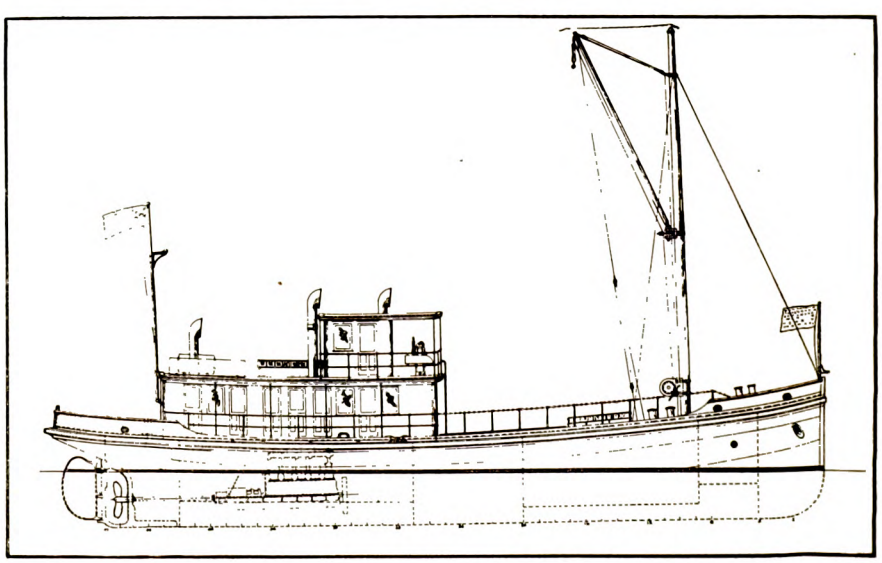
The operating hours of the main engine were 175; the average cost per hour of operation was $0.39.

The auxiliary engine used in the same month:

71 gallons gasoline, at 29c	$20.59
5 gallons Monogram oil, at 53c	2.65
Total	$23.24

The operating hours were 30, and the average cost per hour was $0.775.

Inasmuch as the crew is new to the engines, it is believed that the operating costs can be lessened. However, against this must be considered the rising cost of repairs in the progress of time. An allotment of $3600 per year has been made to cover repairs on each of these boats, or $300 per month, but during the month the cost of repairs was only $9.50.



OUTBOARD PROFILE OF PANAMA SUPPLY BOAT

On the Coasts, Lakes and Rivers

What's Doing and Who's Doing It

Activity Marks Fall Days on Lakes

By C. M. Krauss

A STRIKE of Great Lakes seamen, announced for Oct. 1, was called off after a conference at Washington between representatives of the Lake Carriers' association and Raymond B. Stevens, vice chairman of the United States shipping board, and between Mr. Stevens and representatives of the Lake Seamen's Union. On the suggestion of the shipping board the lake seamen were granted an increase in wages from $85 to $95 a month for able seamen, the vessel owners having voluntarily raised wages from $72 to $85 a few weeks earlier. Suggestions that the Great Lakes be included in the scope of the recent so-called Atlantic agreement were dropped as was one that shipowners guarantee co-operation in securing men to man the merchant fleet now under construction. This co-operation had been promised some weeks earlier in response to a request by a navy officer. Settlement of other points at issue, relating to the abolition of the discharge book and welfare plan of the Lake Carriers' association was deferred until investigation can be made by the shipping board. Another suggestion, relating to the enforcement of the provisions of the seamen's act, was disregarded as enforcement of that act rests with the department of commerce and is specifically provided for by legislation.

* * *

Cornelius Richards, who recently resigned as mate on one of the big ships of the Pittsburgh Steamship Co., and Capt. John Cotter, formerly of the Rutland line, and late of the Lehigh Valley Transportation Co., have been ordered by the government to report for coast duty. Both men have recently graduated from the government's free school of navigation at Buffalo.

* * *

Capt. Erastus Day, first superintendent of the Conneaut docks, died Sept. 29, at the age of 86 years. Captain Day had been connected with the lake trade since 1844 and was widely known among marine men. He started as cook on the schooner H. M. KINNEY. In 1857 he was appointed master and continued to command sailing vessels until 1866, when he was given charge of the ore docks for A. B. Stockwell. Six years later he became superintendent of the N. Y., P. & O. ore docks at Cleveland, which position he held until 1892, when he was appointed superintendent of the Conneaut docks

* * *

The first transatlantic freighter for British registry ever built by the Chicago Shipbuilding Co., South Chicago, was launched last month. The vessel has been named THE WAR BANNER and is 261 feet long, 43½ feet beam and has a depth of 20 feet.

* * *

The characteristic of the Portage lake, ship canal, east breakwater light on the Keweenaw peninsula, Lake Superior, was changed from occulting red to flashing white every 3 seconds. The Pilgrim point light, Portage lake, has been changed temporarily to fixed white.

* * *

A third-order dioptric group flashing white light of 60,000 candlepower, showing one group of three flashes every 12 seconds, has been established on Point Abino, Lake Erie. The light will be exhibited 87 feet above the lake level from a reinforced concrete tower, with extended base containing fog-signal machinery.

* * *

Capt. Harry Lyons has been appointed an officer of a government steamer. He left for the coast Oct. 5.

* * *

The Canadian Steel Corp., which has acquired 2500 acres at Ojibway, Ont., with a frontage of about two miles on the Detroit river, has awarded to the Great Lakes Dreding Co. of Canada, Port Arthur, Ont., the contract for constructing wharves and slips and for dredging in connection with the proposed steel plant at Ojibway. The contract involves millions of dollars. The slips will be 2100 feet long and 250 feet wide.

* * *

Lake coal shipments to American ports for the month of September amounted to 3,413,932 tons and shipments to Canadian ports were 1,195,434 tons. About 3,000,000 tons were unloaded at Lake Superior ports and 926,063 tons were received at Lake Michigan ports.

The Barge W. P. REND, which is loaded with stone, is ashore at Alpena and has been abandoned to the underwriters as a constructive total loss. The barge is insured for $25,000. Bids for floating the vessel have been asked by the underwriters.

* * *

The McDougall-Duluth Co., Duluth, organized this year by Capt. Alex McDougall, is now ready to start the construction of ships. It has booked orders for nine vessels for salt water service.

* * *

The Wheat Export Co., Inc., New York, which is the purchasing department for the allied nations of both American and Canadian grain, has opened a branch office at Buffalo in charge of C. H. Williamson. This organization is handling the grain passing through Buffalo, which previously was handled through Lunham & Moore, forwarding agents of New York, with offices in Buffalo.

* * *

The steamer WILLIAM A. AMBERG was launched at the Lorain yard of the American Shipbuilding Co., Sept. 15. She is the last of three steamers ordered by the Producers Steamship Co., M. A. Hanna & Co., managers, for 1917 delivery.

* * *

The Great Lakes Towing Co., after two years' work, has released the steamer WESTERN STAR, which went ashore at Robertson rock, Georgian bay, Sept. 24, 1915. She is owned by H. K. Oakes, Cleveland, and others.

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A large number of lake vessels have been taken over by the United States shipping board for salt water service, among which are the steamers AMERICA, which was owned by the Crosby Transportation Co., NIAGARA, MINNESOTA, ODORUS and MAHONING.

* * *

Three vessels building for salt water service were launched Sept. 22 at yards of the American Shipbuilding Co. The WAR FINCH was launched at the Cleveland yard, the WAR BEARER went into the water at Detroit and the WAR SIGNAL at the Superior yard.

* * *

The Lake Carriers' association has offered its fleet of bulk freighters for training inexperienced men for the new merchant marine. Wages will be paid while learning. Details may be obtained by addressing the Lake Carriers' association, Cleveland, or any customs officer or steamboat inspector.

* * *

One of the record trips of the season was made by the steamer WILLIAM A. REISS, which left Huron, O., Aug. 18 at 9:05 p. m. with a cargo of 7400 tons of bituminous coal for Superior. After unloading and loading a cargo of 7440 tons of iron ore, the boat arrived at Ashtabula, O., Aug. 26, at 9:05 a. m., making the trip in 7 days and 12 hours. M. H. Mahon is master of the WILLIAM A. REISS and John Richardson is the engineer.

* * *

The steamer PARGNY unloaded over 13,480 tons of ore at the National Tube Co.'s dock, Lorain, O., Sept. 6. This is the largest ore cargo ever unloaded at this port.

* * *

The Canadian Steamship Lines, Ltd., Montreal, have sold to the Canadian and British governments for service on the

Atlantic ocean the six following lake vessels: H. M. PELLATT, J. H. PLUMMER, BEAVERTON, A. E. AMES, MAPLETON and SASKATOON.

* * *

The Conneaut west breakwater light has been moved temporarily about 35 feet northward and 65 feet westward, pending construction work on the pierhead. The height of the light was reduced to 32 feet.

* * *

Notice has been sent out by the hydrographic office calling attention to the private lights at Ruggles' grove, east of Huron, O., and at Rye beach, west of Huron. Masters of vessels entering Huron barbor are warned to be on the lookout for these lights as recently they have been the cause of stranding several vessels. A rear range light will replace the present light at Huron. The new light will be higher and of greater power.

* * *

The largest cargo that has ever been delivered at Conneaut, O., was unloaded by the steamer MCGONAGLE, Sept. 22. She carried 13,460 tons of ore.

* * *

The steamers SAXONIA and PENTICOST MITCHELL, which sank after colliding with each other at the mouth of St. Marys river in May, have been raised. As soon as the SAXONIA is repaired, she will be taken to Port Huron.

* * *

The lights on the following buoys in St. Marys river, established to mark the northeastern side of the channel southwestward of Pipe island, have been discontinued: Pipe island southeast lighted buoy 4A and Pipe island northwest lighted buoy 4B.

Along the Pacific

By Robert C. Hill

FREE navigation schools have been established by the government at Seattle and Tacoma. Another probably will be allotted to Bellingham, Wash. These schools have attracted large classes of young men who are rapidly fitting themselves for positions in the merchant marine. W. J. Grambs, an official of the Puget Sound Traction, Light & Power Co., is section chief for the sixth district of government schools which includes the states of Washington and Oregon.

* * *

The Seattle Construction & Dry Dock Co., Seattle, repaired the Norwegian steamship KEY WEST in record time last month. While returning from the orient on her maiden voyage, the KEY WEST ran aground on one of the Aleutian islands, arriving with her bow badly damaged and with a large rock imbedded in her stem. More than 50 plates in the bottom had to be removed. The double bottom also suffered considerable damage. In addition to these repairs, the machinery was overhauled. The Seattle Construction & Dry Dock Co. took the contract on an estimate of 25 working days. The KEY WEST, however, was delivered in first class shape in 12 days, about 800 men being employed on the work. The KEY WEST was built by the Seattle company. The Norwegian steamship STORVIKEN has also had repairs made recently by the same company.

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The U. S. quartermaster department has awarded the McAteer Shipbuilding Co., Seattle, a contract for a $250,000 steel vessel. Up to this time the McAteer company has been engaged only in the construction of wooden ships.

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Norwegian interests are again in the market for additional wooden ships. The Sandstrom Shipbuilding Co., Seattle, has accepted two contracts for auxiliary motor ships ordered by Norwegian owners.

* * *

The Pacific Steamship Co., Seattle, is planning to extend its field by entering the oriental trade. This firm now has the steamer SENATOR in the far east trade and has announced that the steamer UMATILLA, now on a coastwise run, will be sent to the orient after the close of the Bearing sea season. The same company is reported to have chartered a large foreign steamship for the offshore trade in which the Pacific Steamship Co. is likely to be a strong factor in the near future. The Pacific company has also acquired the two barges, COMMODORE and ENSIGN, to bring freight from the smaller Puget sound ports to the terminals in Seattle. This plan, widely used on the Atlantic cost, has never been applied by Puget sound shipping companies. It is believed this expedient will eliminate much shifting from pier to pier and port to port, which was previously necessary.

* * *

The completion of the Lake Washington canal which connects Lake Union in Lake Washington to Puget sound by locks provides in addition to a salt water harbor a fresh water refuge at Seattle. This new harbor will be used as winter quarters for sailing ships and other vessels which are idle during the winter season. Libby, McNeal & Libby have already placed five sailing vessels, just returned from Alaskan canneries, in Lake Union.

* * *

After lying on the beach near Salaverry, Peru, eight months, the Norwegian steamship CUZCO, owned by W. R. Grace & Co., has been salved and is now undergoing temporary repairs at Callao. The vessel is worth $1,500,000 and had been given up as a total loss.

* * *

The Great Northern Pacific Steamship Co.'s express liners GREAT NORTHERN and NORTHERN PACIFIC are undergoing extensive alterations at the Puget sound navy yard. The vessels were built at Philadelphia and have plied between the Columbia river and San Francisco, with odd voyages to the Hawaiian islands. They recently were taken over by the government and it is believed they will be refitted as transport ships.

* * *

The LIEUTENANT DE MISSIESSY, recently built at the Skinner & Eddy yards, is loading for her first trip.

News of Boston Bay

By George S. Hudson

Capt. John H. Frost, Boston pilot commissioner, died at his home in Hyannis, Mass., recently, aged 74. Captain Frost commanded the sailing ships AGENOR and CONQUEROR in trade between Boston and the Far East. Prior to 1914 he was secretary to the commission. He was a member of the Boston Marine society.

* * *

Four big tugs, the LYKENS, CONESTOGA and MONACACY, of the Reading line, and the GYPSUM QUEEN, owned by the J. B. King Co., have been taken over by the government.

* * *

Mrs. Charlotte S. Patten, widow of the late Captain Patten, of the steel schooner KINEO, successfully instructed a class in navigation for the recruiting office of the shipping board when the regular instructor was called away. Mrs. Patten demonstrated to the director of recruiting that she has a thorough knowledge of the science. Mrs. Patten accompanied her husband on voyages for nearly 20 years.

* * *

A new barge, the P. N. C. No. 21, has been launched at Kennebunkport, Me., for the Piscataqua Navigation Co. She will be commanded by Capt. William Minster in the coastwise trade.

* * *

Scarcity of tonnage has resulted in the steamship MOHAWK, while awaiting new boilers at Boston, being chartered as a barge for service between Boston and New York. The MOHAWK is owned by the Maine Coast Steamship Co.

* * *

The steamship PLYMOUTH, built at Camden, N. J., for the Coastwise Transportation Co., Boston, has been sold to the American & Italian Steamship Co. at a reported price of $2,000,000. The PLYMOUTH has been in commission about three years, cost $500,000 and has a capacity of 8000 tons of coal.

* * *

The lighter HERBERT, owned by the Boston & Rockport Granite Co., has been altered into a schooner rig and is transporting material used in construction of the big drydock at Boston.

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The Massachusetts nautical school ship RANGER has returned from a summer cruise with 107 cadets. There were 25 cadets in the graduating class, about equally divided between deck and engine room.

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The six-masted schooner ADDIE M. LAWRENCE, from Boston for a port in France with a cargo of munitions, has broken up after stranding on the French coast. She was one of the famous Winslow fleet but shortly before the disaster had been acquired by the France & Canada Steamship Co.

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Capt. Clayton Morrissey, of the new steam trawler WALRUS, bears the distinction of having landed the largest fare of fish ever brought to the Boston pier. The total was 330,000 pounds.

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The Merchants & Miners Transportation Co. has sold the SUWANEE and the SOMERSET to the Ocean Steamship Co. The first named ship has been rechristened CITY OF ATHENS and the other CITY OF ROME.

Red Hot Tips From the Trade

Pertinent Suggestions and Personal Gossip

THE Robeson Preservo Products Co., Detroit, has just issued an attractive booklet describing its products and giving an interesting account of their development. The company's weatherproofing is designed to waterproof completely any sound fabric of reasonably close weave, to prevent injury to the fabric from any form of decay or mildew, and to keep the canvas soft and pliable.

The product was developed by W. B. Robeson, consulting chemist of the company. He had been, for many years prior to 1896, a prominent ship chandler on the Great Lakes. In that year he began to experiment in an effort to develop a waterproofing compound for use on hatch covers, boat covers and other paulins. After four years of experimentation he developed the compound which has since been distributed by the Robeson company.

The compound is defined as a chemically inactive, impregnating solution with a natural affinity for vegetable fiber. The description of the compound shows that it contains no vegetable or animal oils and no driers. Its preservative base rests upon several inert gums incorporated with a nonvolatile carrying vehicle with antiseptic properties.

Since its development in 1900, the compound has been used for many different purposes. It is used in the navy on submarines as well as battleships. The booklet points out that the compound is used on lighters in New York harbor as well as on big Atlantic, Pacific and Great Lakes boats. For large vessels canvas treated with the compound is used for covers for hatches, binnacles, telegraphs, life boats, working boats, sounding machines, lead lines, sails, deckloads, skylights, rapid-fire and other naval guns, windlasses and stores. The booklet contains a number of testimonials.

Marine Machinery

Marine machinery manufactured by the Dake Engine Co., Grand Haven, Mich., is described and illustrated in an attractive catalog recently issued. The company's products include an extensive line of marine equipment as well as steam and air motors and pneumatic hoists. The catalog contains complete descriptions of the various kinds of marine equipment, including steam winches, hoists, electric winches, steam steering gears of different types, power capstans, steam anchor windlasses, pilot wheels and standards, and boilers.

Handles Lumber Sales

The organization of the Southern Pine Sales Corp., New York, a few months ago by a number of lumber companies, was designed to meet the need for handling the heavy rush of business which lumber mills are experiencing. The mills, whose output the new company markets, include some of the largest on the South Atlantic coast, among these being the Atlantic Coast Lumber Corp., John L. Roper Lumber Co., Fosburgh Lumber Co., Montgomery Lumber Co., Savannah River Sales Co., A. C. Tuxbury Lumber Co., E. P. Burton Lumber Co., J. F. Prettyman & Sons, Winyah Lumber Co., and the Marion County Lumber Corp. The organizers felt that with so much business in sight none of these as a single unit could handle the rush of orders satisfactorily, and the new corporation was organized to handle the sales. The constituent companies include nine lumber firms and 18 mills shipping both by rail and water.

Direction Indicators

The McNab Co., Bridgeport, Conn., is supplying a large number of its direction and revolution indicators to steamship owners who have vessels under construction, as well as to those who have steamships at present in service. Fleet orders have been received from the Clyde Steamship Co., Mallory Steamship Co., American Line, Texas Co., Standard Oil Co. of New York, Standard Oil Co. of New Jersey and many other large companies.

Many transatlantic liners have just been equipped with the McNab direction indicators. These boats are running in the deadly mine and submarine infested waterways where the safety of a ship depends on efficient navigation, as an armed ship must maneuver into the most favorable position for defense against the enemy when attacked, while an unarmed ship finds her only hope of escape in skillful handling, which means the absolute co-operation between the bridge and the engine room departments. The McNab company has just issued its new indicator catalog in which the several types of indicators are illustrated.

Commander Alexander McNab, vice president of the McNab Co., has sailed for England for the purpose of supplying a large amount of necessary steamship materials for new construction under contract by the United States Shipping Board Emergency Fleet Corp. The McNab company has been the sole representative for a number of years of many prominent steamship appliance manufacturers, such as Brown Bros. & Co., Ltd., Edinburgh, Scotland, manufacturer of steam tiller and telemotor gears; Chadburn's (Ship) Telegraph Co., Ltd., Liverpool, England, manufacturer of ships' telegraphs; J. Stone & Co., Ltd., London, England, manufacturer of ships' ports, side lights, deck lights and various other specialties for steamships.

Boiler Cleaner

An appliance for cleaning Scotch boilers is described in a bulletin issued recently by the Detroit River Iron Works, Detroit. This boiler cleaner has been used in actual service for several years and is designed, when used in conjunction with Scotch boilers, to keep them free from scale and sediment. The valve chamber is cast iron, and is made of two parts bolted together. The two selective type valves are cast iron and are placed on the shaft with the ports 180 degrees apart, so that when one valve is in communication with one of the ports in that end of the valve chamber, the port in the other valve is closed. A universal coupling is fitted on one end of the valve shaft. The valve chamber has a pipe connected to the main blow-off of the boiler. Conductor pipes lead from the ports on the ends of the valve chamber, these pipes connecting at the other end with the collecting nozzles. The sediment enters through these nozzles and is conducted to the valve chamber, passing through the outlet of the chamber into the main blow-off pipe. The bulletin illustrates and describes these cleaners in detail.

Equipment Used Afloat and Ashore

Band Saw Filing, Setting and Jointing Machine—Tower Whirlers

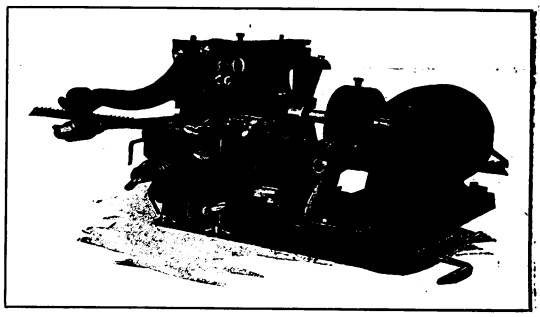
A MACHINE which is designed automatically to file, set and joint band saws in one operation is shown in the accompanying illustration. The machine has been developed by the Wardwell Mfg. Co., Cleveland, and has been in service in a number of woodworking and metal-working plants for some years.

The machine can be operated either by hand or power at a speed of more than 70 teeth a minute. The machine illustrated is designed to handle wood-working band saws from ⅛ to 2 inches wide, with from 2 to 15 teeth to the inch, and metal-cutting band saws in the same range of widths with up to 26 teeth to the inch.

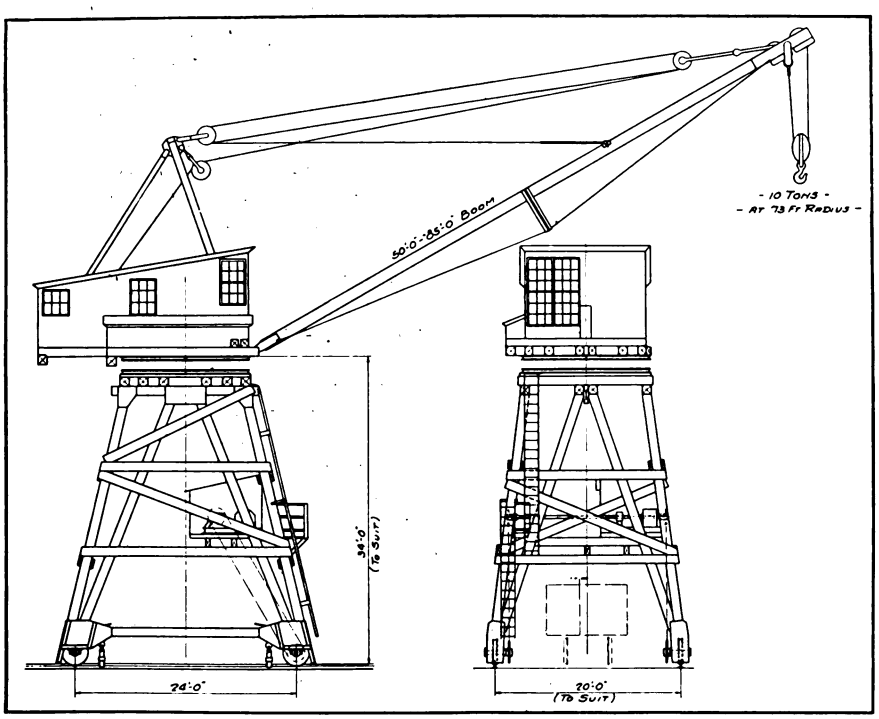
A cam is connected to the main drive shaft. This cam raises a vertical slide frame, guided by heavy steel vertical rods set at such an angle as to govern properly the movement of the filing arm when leaving the back of the tooth. On the point of the cam is a steel roller which lifts the horizontal slide, file holding arm. Two adjustments cover the movement of the pawl lever, attached to the main frame, and rocked by a screw attached to the vertical slide frame. One of these adjustments covers the length of the stroke, the other the amount of cut removed from the face of the tooth. One elevating screw raises the teeth in the vise to the proper level for filing and the other to the proper level for setting. Two pressure screws tighten the vises which hold the saw, one where it is filed and the other where the teeth are set. The filing vise is so constructed that by pulling a pin the jaw is thrown open and the inside exposed for cleaning. A tray is provided to catch any file dust that might cling to the file on its backward movement, thus preventing dust falling into the filling sash slide. Another guard catches the heavier fillings directly back of the vise. The setter is governed and timed by an eccentric steel roller geared to the main drive shaft.

As the file sharpens the tooth, the setter points are setting a tooth. This setting device rocks on a steel rod and can be moved on a sleeve back and forth, so as to bring the setter points opposite the tooth on saws of different sized teeth. When the file rests in the tooth, the setting device is moved so as to bring the setter points opposite to or in line with a tooth and it is then locked. The saws are fed to the machine by a pawl movement. When this pawl or feed finger is allowed to feed one tooth behind the tooth that is being filed, the teeth are all jointed.

When connected for motor drive, a ¼-horsepower motor is used. These motors can be connected to a lamp socket. The hand-operated machine weighs 86 pounds and the machine equipped with motor 145 pounds.



BAND SAW FILING, SETTING AND JOINTING MACHINE



TOWER WHIRLER FOR SHIPYARD USE

Tower Whirlers for Shipyards

The Dravo-Doyle Co., Pittsburgh, has developed the tower whirler for shipyard use, shown in the accompanying illustration. These whirlers have capacities up to 10 tons at a 73-foot radius. They swing through a complete circle. One whirler is designed to serve two shipways. These whirlers are of the self-propelling, self-rotating type, either steam or electric power being used as required. The Dravo-Doyle Co. has given particular attention to designing these whirlers for use in wooden ship yards, where the shipbuilders desire to furnish the timbers. The company points out that two of these whirlers are now being built for one prominent shipyard.

Impressed by New City Piers at Philadelphia

Frank G. White, San Francisco, chief engineer of the California state board of harbor commissioners, made an inspection of Philadelphia's port recently. He was the guest of George S. Webster, director of the department of wharves, docks and ferries, who accompanied Mr. White on an inspection of the Delaware river front. Mr. White expressed much admiration for the city's newest piers at Christian and Catharine streets, both of which structures he examined closely. He stated that he was also impressed by the activity of the port.

F. W. Bedell, agent for the Plant line at Boston, has been appointed chief clerk of the Allan line at Boston.